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U.S. DEPARTMENT OF AGRICULTURE

PLANT INTRODUCTIONS

TWELFTH ANNUAL LIST

1923 - 1924

CONTAINING DESCRIPTIONS OF THE MORE IMPORTANT
INTRODUCED PLANTS NOW READY
FOR EXPERIMENTERS

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

WASHINGTON, D. C.



IMPORTANT NOTE REGARDING LABELS.

THE PROBLEM OF PERMANENT LABELS FOR THE NEW PLANTS SENT OUT TO EXPERIMENTERS HAS BEEN A VERY DIFFICULT AND EXPENSIVE ONE. IN PAST YEARS DESCRIPTIVE LABELS BEARING ABOUT FIFTY WORDS OF TEXT HAVE BEEN ATTACHED TO THE PLANTS BUT IT HAS BEEN FOUND IMPRACTICABLE TO MAKE THESE REALLY PERMANENT. THIS SEASON A DIFFERENT PROCEDURE WILL BE ATTEMPTED. EVERY PLANT WILL GO OUT WITH A PERMANENT ZINC NUMBERED TAG ATTACHED TO IT AND A LONG-LIVED PAPER TAG. THE ZINC TAG, WHICH WILL LAST FOR ABOUT TEN YEARS, WILL BEAR THE SEED AND PLANT INTRODUCTION (S.P.I.) NUMBER AND THE PAPER TAG WILL BEAR BOTH THE NUMBER AND NAME. THIS ANNUAL LIST GIVES A FULL ACCOUNT OF EACH PLANT SPECIES OR VARIETY BY NUMBER AND BY NAME SO THAT YOU MUST KEEP THIS ANNUAL LIST IF YOU DESIRE TO KNOW WHAT YOUR PLANTS ARE.

All plants intended for distribution to experimenters are inspected at the Plant Introduction Gardens by officers of the Federal Horticultural Board. At the time this Annual List goes to press the inspection has not been made. It is possible, therefore, that quarantine regulations may prohibit the distribution of a few plants herein described.

PLANT INTRODUCTIONS

Experimenters will please read carefully this Introductory Note before sending in their requests for plant material.

THIS, the Twelfth Annual List of Plant Introductions, contains descriptions of many new and rare plants, not yet widely tested in this country. The available information concerning some of them is meager, and it is therefore impossible to speak with assurance regarding their value, their cultural requirements, and their adaptability to the various climates and soils of the United States.

These plants have been imported because of some direct or indirect use which, it is believed, can be made of them. They are first placed at the disposal of the experts engaged in plant breeding, crop acclimatization, and horticultural investigations generally in the United States Department of Agriculture and the State Experiment Stations. Many of them have been grown in sufficient quantity, however, so that they can be distributed to private experimenters who have the facilities to test them carefully. The List is therefore sent to those who have qualified as Experimenters with the Office of Foreign Seed and Plant Introduction, and who have indicated a willingness to care for material sent them.

Accompanying this Annual List are complete Check Lists showing all seeds and plants available for distribution at the several Plant Introduction Gardens during the season 1923-24. Applicants for material should fill out all blanks on the first sheet accompanying the Check Lists, place a mark to the left of the S.P.I. (Seed and Plant Introduction) number of each plant desired, and return the lists promptly to this office.

It should be distinctly understood that the Office does not agree to supply all the plants requested. The object of the Annual List and the Check Lists is to place experimental material where it is thought the chances of success are best; to this end the experts of the Office will allot the available number of plants to those experimenters whose location and facilities seem most suitable, having in mind, at the same time, the order of receipt of the returned check lists, and giving preference to those which arrive first.

The shipping season extends, as a rule, from December first to April fifteenth. Because of the large quantity of plants which must be handled, it is difficult for the Office to single out individual requests and ship them at a certain date; where there are, however, valid reasons for requesting that material be sent at a specified time, every effort will be made to meet the request.

These plants are placed in the hands of experimenters with the understanding that they will be given unusual attention, and that reports on their behavior will be sent to this Office from time to time. Not only have their introduction and propagation cost a great deal of money,

but many of them have been secured by Agricultural Explorers and others at the expense of hardships, and even dangers. They are, in numerous instances, species which are not easily secured through ordinary channels. They merit, therefore, the most careful attention.

The plants distributed in the spring of 1924 will have small zinc labels of a type not heretofore used by this Office. In place of the S.P.I. number, name, origin, and a brief characterization of each plant, these will carry nothing but the S.P.I. number. They will be smaller than those used during the past few years, and will be attached by means of copper wire. Unlike the cloth labels previously employed, they will not be injured if they fall to the base of the plant and are covered with soil for several months.

Experimenters should note that these labels carry nothing but the S.P.I. number. It will be necessary to refer to the Annual List of Plant Introductions, or to the Inventories published by the Office, for information regarding the plants. Each Inventory lists the seeds and plants imported during a period of three months. Its object is to serve as a historical record; it is not printed immediately following the arrival of the plants, but eighteen to twenty-four months later. The edition is limited, and it cannot be supplied to all experimenters. This makes essential the preservation of the Annual List as a work of reference, and the Office desires to urge upon its cooperators the importance of this step. Unless the Annual Lists are preserved, the Office will be flooded with inquiries from people who have received plants, and who desire information concerning them. Such inquiries involve much unnecessary labor and expense.

A limited number of plants grown and distributed by the Office are not described in this Annual List. These are species of which very small stocks are available, or which are not thought to be of sufficiently wide use to justify inclusion. Experimenters who receive these plants will be furnished with copies of the Inventory cards covering them: these cards supply the same data as the Annual List, and, like the latter, should be preserved for reference.

To the end that the work of Plant Introduction may be more and more far reaching and efficient, the cooperation of experimenters is earnestly requested. It is particularly desired that reports be sent to this Office regarding the flowering, fruiting, hardiness, utilization and other interesting features of plants which have been sent for trial; and it is hoped that experimenters will at all times exercise care to preserve the original labels sent with the plants, or accurate plates showing the location and S.P.I. number of each one.

All seeds and plants imported by this Office are examined upon arrival by officers of the Federal Horticultural Board, and plants grown from these original importations are further inspected before they are distributed for testing. Every effort is made to insure freedom from injurious plant diseases and insect pests.

DAVID FAIRCHILD.

Agricultural Explorer in Charge.

DESCRIPTIVE LIST.

55420. ACACIA CATECHU. From Egypt. Presented by E. E. Massey, Government Botanist, Khartum, Anglo-Egyptian Sudan. A small tree, with handsome foliage and spikes of white or yellow flowers. It yields a good quality of gum arabic, and also the product known as cutch. The timber takes a beautiful polish; it has yellowish white sapwood, and red heartwood of great density. This tree is suggested for trial in the arid Southwest.

55422. ACACIA SPIROCARPA. From Egypt. Presented by E. E. Massey, Khartum, Anglo-Egyptian Sudan. An umbrellalike tree 20 to 40 feet high, native to Abyssinia, where it is common on arid and rocky land. The snow-white flowers are borne in large clusters, and the narrow, spirally twisted pods are ornamental. Probably susceptible to frost.

54799. ACACIA VEREK. Gum-arabic Tree. From Egypt. Presented by Maj. R. G. Archibald, Wellcome Tropical Research Laboratories, Anglo-Egyptian Sudan. A small tree which thrives in semiarid climates where heavy frosts are not experienced. It yields a fine quality of gum arabic. Suggested for trial in mild-wintered portions of the southwestern United States.

56288. ACER DAVIDI. Maple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. An attractive ornamental shade tree with large coarsely-toothed leaves and long pendent clusters of fruit. From the Likiang Snow Range, where it attains a height of 60 feet.

56454. ACER HOOKERI. Maple. From India. Presented by G. H. Cave, curator, Lloyd Botanic Gardens, Darjiling. A handsome shade tree, 40 to 50 feet high, native to the Himalayas at altitudes of about 10,000 feet. The bark is brown and deeply fissured, the leaves oval and not lobed as in more familiar species, - sometimes they are copper-colored as in some of the Japanese maples. The wood, which is gray with small pores and numerous fine medullary rays, is very handsome.

55840. ACTINIDIA CHINENSIS. Yang Tao. Presented by D. W. Coolidge, Pasadena, Calif. An ornamental deciduous climber, native to Szechwan, China. This plant has attracted considerable attention because of its edible fruits, which may be eaten from the vine, served with sugar and cream, or used for jams and sauces. They are russet brown, hairy, about 2 inches long, and have greenish flesh of pleasant flavor, resembling that of gooseberries but tempered with a taste peculiarly their own. The leaves have a plushlike texture and an unusual dark-green color, and their large size and regular spacing add to the beauty of the vine. The flowers are buff-yellow to white, fragrant, about an inch broad, and are produced in great abundance.

54460. ACTINIDIA CHINENSIS. Yang Tao. Presented by Bruce Drummond, Indio, Calif.

56608. *ACTINIDIA CHINENSIS*. Yang Tao. From China. Presented by Geo. B. Newman, Chengtu, Szechwan.

42683. *ACTINIDIA CORIACEA*. Received from Vilmorin-Andrieux & Co., Paris, France. A strong-growing, woody vine native to central China; it is useful for covering arbors and pergolas, and for training over porches. The leaves are large and leathery, and the clusters of red or rarely yellow, sometimes white-margined flowers, and small, spotted berries, make it highly ornamental. Its cultivation is practicable only in mild-wintered regions.

ALEURITES FORDII. Tung-Oil Tree. From China. From the seeds of this tree is obtained the valuable drying oil known as tung oil, or China wood-oil, used in the manufacture of high-grade paints, varnishes, and linoleums and for many other purposes. The seeds are not edible. The species is useful as a street and shade tree, being a rapid grower with catalpalike leaves, and producing a profusion of pinkish white flowers in the spring just as the leaves begin to expand. A deep sand-clay loam is preferred by this species, but it grows well in other well-drained soils that produce ordinary crops. It is already grown scatteringly in the Southern States and in the warmer parts of California; it does not thrive where the winter temperature falls much below 15° F. Tung oil is being used more extensively each year, and the annual imports now amount to more than 10 million gallons. The oil has become so important in the industries mentioned that the question of a steady supply is now a matter of serious concern to manufacturers. Due to recent disturbances, the supply of the oil from China has been much interrupted and the price has occasionally risen to three times what was formerly considered normal. In view of the foregoing and the further fact that the imported product is nearly always adulterated, it seems worth while for Southern farmers to experiment on a small scale with the cultivation of the tung-oil tree.

56636. *ALNUS NEPALENSIS*. Alder. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree from the mountains of Yunnan, where it sometimes reaches 70 feet in height, and has a trunk 3 to 4 feet thick. It is a rapid grower, said to thrive under rather adverse conditions. For trial in the southern United States.

55411. *AMERIMNON SISSOO*. Sissu. From Dehra Dun, India. Presented by R. S. Hole, Forest Botanist. A splendid leguminous forest and timber tree native to subtropical slopes of the lower Himalayas. It is highly esteemed as an ornamental tree for street planting, as well as for its very durable wood which seasons well, does not warp or split and is strong and elastic. The thin layer of sapwood is white, while the heartwood is very hard and brown with darker longitudinal veins. Introduced for trial in southern Florida.

39434. *AMPELOPSIS ACONITIFOLIA*. From Pingyanfu, Shansi, China. Collected by Frank N. Meyer, Agricultural Explorer. This is a handsome vine related to the Virginia creeper, with cut-toothed leaves and yellow berries. It is valued as a porch and pergola vine on account

of its rapid growth and comparative hardiness.

33215. AMYGDALUS COMMUNIS. Malaguena Almond. From Granada, Spain. Introduced by W. T. Swingle, of the United States Department of Agriculture. This is one of the famous Jordan almonds, of which large quantities are exported from Spain to the United States. Dr. Swingle states that it withstands arid conditions and succeeds best on warm limestone soils. For trial in the almond-growing regions of the Pacific Coast.

33218. AMYGDALUS COMMUNIS. Almond. Introduced from Spain by Walter T. Swingle, of the U. S. Department of Agriculture. This variety is said to be somewhat more cold-resistant than other almonds because of the peculiar attachment of the flowers which are turned downward so that the corolla protects them from light frosts and permits the development of fruits when the flowers of other varieties are injured.

24807. AMYGDALUS PERSICA. Peach. From Tashkent, Turkestan. Collected by N. E. Hansen, Agricultural Explorer. A small white freestone peach, with melting juicy flesh. While highly flavored, it is too small to be commercially valuable. Originally introduced as seed; budded plants are now available from a selected seedling fruited at Chico, California.

32374. AMYGDALUS PERSICA. Mexican Seedling Peach. Selected at the Government Experimental Farm, San Antonio, Texas, where trees were grown from seeds collected by G. Onderdonk in Mexico. A large, yellow, clingstone peach of pleasant subacid flavor, ripening at the San Antonio Station about the first of September. As it is a good shipper, it may prove to be a fruit of commercial value.

33219. AMYGDALUS PERSICA. Vainqueur Peach. From Granada, Spain. Scions imported by W. T. Swingle, of the United States Department of Agriculture. This peach has proved hardy as far north as Massachusetts, and is one of the earliest to ripen in all parts of the United States to which it has been distributed. The fruit is oval, yellowish, blushed with carmine over two-thirds of the surface. When picked for shipping the variety has the appearance of a clingstone, but when fully ripened, the flesh separates from the pit readily, so that it can almost be classified as a freestone. The flavor is excellent, and the variety can be strongly recommended, especially as an early peach for home use.

35201. AMYGDALUS PERSICA. Peach. From Mengtze, Yunnan, China. Presented by the Commissioner of Customs. The fruit of this variety is a golden cling with firm, pure yellow flesh of good quality. A promising peach for commercial purposes. Budded plants are available from a selected seedling.

36125. AMYGDALUS PERSICA. Sutter Creek Peach. Grown at the Plant Introduction Garden, Chico, Calif. A clingstone variety of large size

and good quality, ripening a little later than the well-known Elberta which it resembles. It is of interest to breeders and commercial growers that this variety is said to be somewhat resistant to leaf-curl.

36126. AMYGDALUS PERSICA. Bolivian Cling Peach. Collected by Edward Ehrhorn in Bolivia, from trees raised by the Franciscan monks. A fruit of good size, fine quality and attractive appearance.

38178. AMYGDALUS PERSICA. Peach. From Feicheng, China. Grafted trees and scions collected by Frank N. Meyer, Agricultural Explorer. A Chinese peach, clingstone, with very large fruits sometimes weighing a pound each. The color is pale yellow with a slight reddish blush; the flesh is white, pinkish close to the pit, very sweet, juicy, and pleasantly flavored. In central California, where the variety has been found to ripen its fruit in August, it has shown good keeping and shipping qualities.

41395. AMYGDALUS PERSICA. Dwarf Peach. From Kiayingchow, Kwangtung, China. Presented by George Campbell. A Chinese ornamental, grown in pots as a house plant. Mr. Campbell reports one tree 15 inches high, with a stem no larger than a lead pencil, which bore five full-sized, white-fleshed, clingstone peaches of good quality. The blossoms are showy, and the prettily colored fruits hang on the tree for a long time. Buds from original seedlings.

43124. AMYGDALUS PERSICA. "A 1" Peach. From Avondale, Auckland, New Zealand. Presented by H. R. Wright. Said to be an ideal market peach, which bears heavily each year. The growth is short, thick, and compact, with very large handsome foliage.

43127. AMYGDALUS PERSICA. Ideal Peach. From New Zealand. Plants presented by H. R. Wright. This variety is medium early, with fruits of good size. The firm, golden-yellow flesh is of fair quality.

43129. AMYGDALUS PERSICA. Late Champion Peach. From New Zealand. Plants presented by H. R. Wright. A large fruit with bright yellow skin having a red blush. The flesh is bright yellow, juicy, and of good flavor. Said to be one of the best late freestone peaches - a fair shipper, a good drier, and well adapted for canning.

43132. AMYGDALUS PERSICA. Motion's Cling Peach. From New Zealand. Presented by H. R. Wright. This is a large clingstone peach, resembling the Stark. The fruits are richly colored and of good quality. It is said to be an excellent market variety and one which yields heavily.

43133. AMYGDALUS PERSICA. Muir's Perfection Peach. From New Zealand. Plants presented by H. R. Wright. A mid-season freestone peach of large size. The white flesh is of excellent flavor. The variety is recommended by Mr. Wright as a dependable bearer.

43135. AMYGDALUS PERSICA. Paragon Peach. From New Zealand. Plants

presented by H. R. Wright. This is a standard New Zealand clingstone peach with yellow flesh of good quality. It is recommended by Mr. Wright as a dependable bearer.

43136. AMYGDALUS PERSICA. Shipper Cling Peach. From New Zealand. Plants presented by H. R. Wright. This large clingstone peach is attractive in appearance and of good quality. The skin is orange-yellow with a red blush, the flesh yellow and excellent in flavor. Since the fruit retains its form when cooked it is recommended by Mr. Wright as of value for canning.

43137. AMYGDALUS PERSICA. Up-to-Date Peach. From New Zealand. Plants presented by H. R. Wright. Described as a vigorous-growing, heavy-yielding variety producing large, freestone, yellow-fleshed peaches of excellent quality. The fruits are too delicate in texture to withstand shipment to distant markets, but for canning and home use they are said to be excellent.

43289. AMYGDALUS PERSICA. Peach. Original introduction from Canton, China. Presented by P. R. Josselyn, American vice-consul. Budded plants are available from a selected seedling of the Ying Tsui To (eagle's beak peach). This is a small, white, freestone peach with sweet white flesh and a red pit. It should prove of value for home use.

55563. AMYGDALUS PERSICA. Peach. Plants budded from a seedling grown and selected at the Plant Introduction Garden, Chico, Calif., from seed obtained through John R. Putnam, American consul at Valencia, Spain. The fruits of this variety are large and yellow with a red blush. The flesh is golden yellow throughout and excellent in flavor; the pit is small. This variety, weighing on the average 9 ounces, promises to be of value as a commercial canning peach. It remains firm when cooked, retains its delicate flavor, and does not require a heavy sirup. The fruits ripen at Chico about August 20.

55564. AMYGDALUS PERSICA. Peach. Plants budded from a selected seedling. Grown at the Plant Introduction Garden at Chico, Calif., from seed obtained through John R. Putnam, American consul at Valencia, Spain. The fruits of this variety are golden yellow, blushed red, with a deep basin and distinct suture. The pit is small and yellow, not coloring the flesh which is firm and delicious. The average weight of the fruits is about 5 ounces. This variety is a good shipper and may prove valuable for canning; it ripens at Chico about the middle of August.

55813. AMYGDALUS PERSICA. Peach. Seedling grown at the Plant Introduction Garden, Chico, Calif. This tree has matured a heavy crop of exceptionally delicious peaches. The fruit is yellow with red cheeks, slightly flattened at the ends and bulging in the center, about 3 inches in diameter, and $2\frac{3}{4}$ inches long. The basin is wide and shallow, the suture rather indistinct. The flesh is yellow, very juicy, and of fine quality. In flavor this variety compares favorably with Late Crawford; it is about a week later than Elberta, and in texture it is better than the latter.

55835. AMYGDALUS PERSICA. Peach. Seedling of the variety Tardio Amarillo from Spain, grown at the Plant Introduction Garden, Chico, Calif. The fruits are 2-1/8 by 2-1/4 inches, weighing on the average 4 ounces; the skin is golden with a faint blush, the basin deep and narrow, the depression at the suture slight. Both flesh and pit are yellow. The season for this variety in Chico is early September. This is a good canning clingstone peach and a heavy bearer.

55836. AMYGDALUS PERSICA. Peach. Seedling of the variety Tardio Amarillo from Spain, grown at the Plant Introduction Garden, Chico, Calif. The fruits are 2 by 2½ inches, weighing 4 ounces on the average; the basin is deep and narrow and the suture visible only as a line; the flesh is deep yellow, of good texture and flavor; the pit is small and yellow. This peach should be tested for canning purposes.

26503. AMYGDALUS PERSICA NECTARINA. Nectarine. Original introduction from Chinese Turkestan. Seeds presented by E. Coates. The fruits are large, freestone, and pale yellow with a red blush. The flesh is creamy white, red at the stone, juicy, crisp, subacid, and of very good quality. The fruit keeps well in shipment. Budded plants are available from a selected seedling.

30648. AMYGDALUS PERSICA NECTARINA. Nectarine. Original introduction from Guma, Sinkiang, China. Collected by Frank N. Meyer, Agricultural Explorer. Budded plants are available from a selected seedling. This is a medium-sized, freestone nectarine of good flavor and quality, with a red pit.

34685. AMYGDALUS PERSICA NECTARINA. Quetta Nectarine. Presented by Lieut. W. L. Maxwell, Quetta, Baluchistan. The tree is large, handsome, and unusually hardy for a nectarine, although it thrives best in regions not having severe winters. The large, round fruits, slightly over 2 inches in diameter, are green heavily blotched with red. The greenish flesh, strongly marked with red around the pit, is juicy and of rich, tart flavor. This is an unusually good nectarine, sufficiently firm to ship well.

43139. AMYGDALUS PERSICA NECTARINA. Ansenne Nectarine. From New Zealand. Plants presented by H. R. Wright. The fruits are large, red, freestone, of splendid appearance, and excellent in flavor and quality. This variety bears freely and seems worthy of careful trial.

43140. AMYGDALUS PERSICA NECTARINA. Diamond Jubilee Nectarine. From New Zealand. Plants presented by H. R. Wright. Fruits of this freestone variety are very large, with highly colored, melting, juicy, sweet flesh of excellent flavor.

43141. AMYGDALUS PERSICA NECTARINA. Gold Mine Nectarine. From New Zealand. Plants presented by H. R. Wright. A fine large freestone nectarine of red and yellow color. The cream-white flesh is sweet and juicy.

43142. AMYGDALUS PERSICA NECTARINA. Lippiatt's Late Orange Nec-

tarine. From New Zealand. Plants presented by H. R. Wright. The fruits of this variety are large and handsomely colored, being orange and dark red. The flesh is juicy, with distinctive flavor.

43143. AMYGDALUS PERSICA NECTARINA. Muir's Seedling Nectarine. From New Zealand. Plants presented by H. R. Wright. This large free-stone nectarine is of handsome appearance and excellent quality. The flesh is slightly pink at the pit, juicy, and of fine flavor.

43144. AMYGDALUS PERSICA NECTARINA. New Boy Nectarine. From New Zealand. Plants presented by H. R. Wright. The fruits are of medium size, the skin green and mottled with red; the flesh is red near the pit, and of fair quality. The variety is said by Mr. Wright to be a prolific bearer.

43146. AMYGDALUS PERSICA NECTARINA. Surecrop Nectarine. From New Zealand. Plants presented by H. R. Wright. A productive sort, yielding medium-sized green fruits mottled with red. The flesh is of fair quality with a mild flavor.

55709. ANNONA DIVERSIFOLIA. Ilama. From Guatemala. Seeds forwarded by H. W. Goforth, American consul, at the request of Wilson Popenoe, Agricultural Explorer. The ilama, indigenous in the mountains and foothills of southwestern Mexico, Guatemala, and Salvador, is one of the finest annonaceous fruits which can be grown in the tropical lowlands. The fruit is conical, oval or round; large specimens weigh about $1\frac{1}{2}$ pounds. The edible pulp is cream-colored or rose-tinted and incloses the hard, smooth, nutlike seeds. The flavor is sweet, resembling that of the sugar-apple and the cherimoya, or is, in some varieties, mildly acidulous. Introduced for trial in southern Florida and southern California.

42455. ARRACACIA XANTHORRHIZA. Apio. Presented by Homer Brett, American consul, La Guaira, Venezuela. The apio, or arracacha as it is known in Colombia, is a plant belonging to the parsnip family, which has been cultivated since remote times in the cooler mountainous regions of northern South America, for the sake of its large yellowish edible root. The latter, which is not unlike a parsnip in shape, is either sliced raw and fried like potatoes, or boiled like parsnips, both methods making very palatable dishes. The plant is sufficiently frost resistant to grow in the Southern States and California, and is propagated by divisions of the crown, with about a quarter of an inch of root attached. Although not very particular as to soil, the plants require rain or irrigation at least once a month. Each hill should produce 10 to 15 tuberous roots, which are developed and harvested the first year.

51361. BAMBOS BALCOOA. Bamboo. From India. Seeds presented by P. H. Davies, Superintendent, Government Botanic Gardens, Lucknow, Oudh. This is the large and characteristic bamboo of the Bengal villages. The thick-walled stems grow in clumps, attain 50 to 70 feet, and are silvery gray. It is said to be the best species in Bengal for scaffolding and other purposes which require size, lightness, and strength,

while long immersion in water is thought to make the timber firmer and less subject to attacks by borers. This species seeds freely which makes propagation very easy. Suitable only for southern Florida and other warm sections.

54428. BENINCASA HISPIDA. From China. Presented by F.A. McClure, Canton. A Chinese vegetable similar to squash, called **Paak pei tung kwa.**

56292. BENZOIN sp. Spice Bush. From China. Collected by J. F. Rock, Agricultural Explorer. Along the Taiping River this is a common small tree with a spreading crown. The trunk is sometimes a foot or more in diameter, though usually less, and the leathery aromatic leaves are dark green and glossy. From the scarlet, one-seeded fruits, borne in short clusters, is obtained a white, oily liquid used to make a yellow wax which is valued in China for softening leather, for burning, and for other household purposes. It is an ornamental dooryard tree, especially attractive on account of its delightfully pungent leaves and brilliant fruits.

52454. BERBERIS AGGREGATA. Barberry. From China. Received from Vilmorin-Andrieux & Co., Paris, France. This little-known barberry comes from thickets in the Min Valley of western Szechwan, where it grows at altitudes of 4,000 to 7,000 feet. It reaches a height of 5 feet and has yellowish brown spines in clusters of three; the yellow flowers, about one-fourth of an inch wide, occur in dense spikes and are followed by attractive salmon-red fruits.

54061. BERBERIS AGGREGATA. Barberry. From China. Presented by the Arnold Arboretum, Jamaica Plain, Mass.

55071. BERBERIS AGGREGATA PRATTII. Barberry. From China. Presented by Vilmorin-Andrieux & Co., Paris, France. A variety of *B. aggregata* which forms a dense mass of twiggy branches from which appear long, whiplike young shoots. The flowers are pale yellow in short panicles and the ovoid, salmon-red fruits, which ripen in September are borne in great abundance.

55718. BERBERIS DICTYOPHYLLA. Barberry. From China. Collected by J. F. Rock, Agricultural Explorer. This handsome thorny hedge plant is of value as an ornamental on account of its pretty flowers which are solitary and pale yellow. It grows naturally on limestone in the Likiang Mountains, at 12,000 feet. The fruits, which are brilliant red, enhance the beauty of the plant.

BERBERIS HOOKERI VIRIDIS. Barberry. Presented by Sir David Prain, Kew, England. An evergreen ornamental shrub native to the Himalaya Mountains, producing a dense thicket of erect, angled stems, which branch near the top. The leathery leaves are dark green above and whitened beneath and the margins are armed with slender teeth; the flowers, large for this genus, are pale yellow blotched with red. The handsome purplish black berries, which appear in autumn, are narrowly cylindrical and have the ornamental advantage of remaining on the

plant until the following spring. This is a fairly hardy, useful hedge plant which remains dwarf without pruning.

9662. BIGNONIA CHAMBERLAYNII. From Funchal, Madeira. Received through Barbour Lathrop and David Fairchild. A beautiful tropical climber, which produces clusters of tubular, bright-yellow flowers. Suitable for walls and trellises in southern California and southern Florida.

56294. BUDDLEIA FORRESTII. From China. Collected by J. F. Rock, Agricultural Explorer. This very attractive ornamental shrub is found on the pure limestone soils of the Likiang Snow Range at altitudes of about 10,000 feet. The foliage is covered with a dense coat of heavy white wool which forms a pleasing contrast to the spikes of lavender-blue flowers.

55077. BUDDLEIA JAPONICA. From Japan. Presented by Vilmorin-Andrieux & Co., Paris, France. This deciduous shrub, 3 to 5 feet high with long spikes of pale-lilac flowers, is a handsome ornamental.

51405. BYRSONIMA SPICATA. Nance. From Guatemala. Collected by Wilson Popenoe, Agricultural Explorer. In Guatemala this species makes a small tree, with yellow flowers in clusters, followed by red and yellow fruits as large as cherries. In Florida it has shown itself an excellent hedge shrub, its growth being less vigorous in that state than in its native home. The fruits are edible, but are not of much value.

51503. CALLISTEMON CITRINA. Bottle-brush. From Kenya Colony, Africa. Collected by Dr. H. L. Shantz, Agricultural Explorer. A small tree of the myrtle family, common in some of the central African provinces. The showy clusters of scarlet stamens render the tree very attractive when in flower. It is suggested for trial in California and Florida.

46313. CANNA EDULIS. Queensland Arrowroot. Presented by J. M. Westgate, Hawaii Agricultural Experiment Station, Honolulu. A close relative of the ornamental cannas, cultivated for its edible tubers, which contain a large percentage of starch. The plant is very vigorous and often becomes 8 or 9 feet high, with handsome bronze-green leaves and scarlet flowers. When properly cooked the tubers are very palatable; according to F. G. Krauss, of the Hawaii Agricultural Experiment Station, they should be boiled for thirty minutes and then mashed like boiled potatoes. Prepared thus they are comparable in taste with potatoes, and in Hawaii the yield is over twice as great. As much as sixty pounds of tubers have been obtained from a single hill. The tops can be used as forage for cattle and swine.

It is as a commercial source of starch, however, that the Queensland arrowroot is most promising. In Australia it is grown for this purpose in preference to the Bermuda arrowroot (*Maranta arundinacea*), because of its much higher yield. A deep, rich, well-drained soil and moderate rainfall are necessary for the successful cultivation of this plant. In the United States it will probably have to be grown as an annual, except in the warmest parts of Florida.

46821. *CANNA EDULIS*. (Same as 46313.)

53944. *CANNA EDULIS*. Presented by J. A. Hamilton, Kulara, North Queensland, Australia.

55472. *CAPSICUM ANNUUM*. Red Pepper. A variety of paprika introduced from Spain and presented, without description, by Henry C. A. Damm, American consul at Valencia.

55473. *CAPSICUM ANNUUM*. Red Pepper. A variety of paprika introduced from Spain and presented, without description, by Henry C. A. Damm, American consul at Valencia.

56808. *CARAGANA BOISL*. From China. Presented by A. Meunissier, Verrieres-le-Buisson, France. A shrub native in Szechwan and eastern Tibet. It grows 10 to 12 feet high and has long gracefully arching branches. The bright-yellow flowers make it a handsome decorative plant.

54043. *CARISSA CARANDAS*. Karanda. From Bombay, India. Presented by William Burne, Economic Botanist to the government of Bombay. A spiny evergreen shrub of ornamental foliage and pretty white flowers. The small purplish black fruits are edible either from the bush or in the form of jellies and tarts. They are a common article of trade in the fruit markets of southern India. Sufficiently frost resistant for cultivation in southern Florida where it makes an excellent hedge plant.

54923. *CASSIA NODOSA*. Pink-and-white Shower. From Hawaii. Presented by Dr. H. L. Lyon. This magnificent flowering tree is much used for street and ornamental planting in Honolulu, and elsewhere in the Tropics. It is a moderate-sized, deciduous species with long drooping branches and glossy leaves. During May and June it bears a profusion of bright pink and white, rose-scented flowers in dense clusters. It is native to India and the Philippines; in the United States it will succeed only in the warmest sections.

54984. *CASSIA NODOSA*. (as above).

54463. *CASSIA SIAMEA*. Kassod Tree. From Hawaii. Presented by Dr. H. L. Lyon. A medium-sized or large tree with grayish bark, graceful pinnate leaves, and large clusters of small yellow flowers. It is valued as an ornamental and also for its hard, heavy, durable timber, which is used for mallets, tool handles, walking sticks, for building purposes, and for fuel. For cultivation in regions free from severe frosts.

54924. *CASSIA SIAMEA*. (as above).

55025. *CASSIA SIAMEA*. Kassod Tree. From Los Banos, Philippine Islands. Presented by J. E. Higgins, College of Agriculture.

56392. *CASTANEA MOLLISSIMA*. Chestnut. From China. Presented by C. A. Reed. This tree grows in the neighborhood of the ancient Ming

Tombs at Hsingchuang, Chihli, near Peking. The nuts are of medium size and are fairly good to eat. The species is of interest at this time owing to the fact that it has been found slightly resistant to the chestnut blight.

55984. CASTANEA sp. Chestnut. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tall tree found wild at altitudes of 8,000 feet in the valleys of the Haitung Range. The nuts are sweet and delicious.

56130. CASTANEA sp. Chestnut. From China. Collected by J. F. Rock, Agricultural Explorer. A wild chestnut from the neighborhood of Tengyueh, Yunnan.

56768. CASTANEA sp. Chestnut. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This lofty tree, 80 to 100 feet tall, with trunks 3 feet in diameter, is found in the pine forests of the Shweli Valley, at altitudes of about 6,000 feet. The burs are in long densely packed spikes and the involucre are covered with long, soft, green spines. The small nuts are solitary or in twos. This is one of the finest forest trees of Yunnan and, according to natives, the wood is durable and never attacked by insects.

56084. CATALPA DUCLOUXII. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A splendid forest tree of the Likiang Valley where it grows at altitudes up to 9,400 feet. It often attains 80 feet in height, with a trunk 4 feet in diameter. The large clusters of pinkish purple flowers appear in early spring. The hard durable wood is used for building purposes.

55985. CHAENOMELES sp. Chinese Quince. From China. Collected by J. F. Rock, Agricultural Explorer. A tree, 50 to 80 feet high, which has been domesticated by the Chinese around Talifu, Yunnan, where it is called *Mu kua*. The very aromatic fruits, rich yellow with a reddish tinge, have firm yellow flesh; they make jelly and preserves closely similar to those prepared from the common quince.

CHAYOTA EDULIS. Chayote. From Mexico, Central America, and the West Indies. A vigorous-growing, perennial-rooted vine, suited to the Southern States. The plant yields enormous crops of fruits that keep well and are more delicately flavored than the squash. The freedom from fiber, the fine texture, and the ease of its preparation for cooking render the chayote adaptable for use in a variety of delicious dishes. The fruits may be fried, creamed, stuffed, served in stews, baked with meats, pickled, or preserved. Special directions for growing and cooking will be forwarded on request.

21617. CHIONANTHUS RETUSA. Chinese Fringe Tree. From Shantung, China. Collected by Frank N. Meyer, Agricultural Explorer. A beautiful deciduous ornamental tree bearing in spring a multitude of white, deliciously fragrant flowers with handsome fringed petals, followed in the fall by masses of blue berries resembling wild grapes. This tree is used by the Chinese as a stock on which to graft their scented olive, *Osmanthus fragrans*.

23028. CITRUS LIMONIA. Meyer lemon. From northern China. Collected by Frank N. Meyer, Agricultural Explorer. Six plants of this dwarf lemon were secured by Mr. Meyer at Fengtai, near Peking, China, in 1908, and from these plants hundreds have been propagated and distributed throughout the United States. In the North the Meyer lemon is keenly appreciated as a house plant both for ornamental use and for its fruits. Small plants handled in this way have been known to bear as many as a dozen good-sized lemons in one season. Owing to the fact that this is probably the hardiest lemon now grown in the United States, and at the same time is of excellent quality, it is likely that it will extend lemon culture in the South to northern limits hitherto unknown. The fruits are somewhat larger than the lemons usually seen on the market, and have a smooth, fine, thin skin of a light-orange color. The flesh, which is of a deeper tint than that of ordinary lemons and is less acid, contains only a few seeds.

23456. CLAUCENA LANSIUM. Wampi. From China. Presented by Mrs. J. Franklin Kelley, Hoitow, Island of Hainan. The wampi is a fruit the size of a large marble, yellow when ripe, with a tart, aromatic flavor; it makes a cooling drink and fine jam. The tree itself is symmetrical and of ornamental appearance. Sufficiently frost resistant for cultivation in southern Florida.

51768. COLEUS ROTUNDIFOLIUS. From Siam. Collected by J. F. Rock, Agricultural Explorer. A vegetable cultivated in the Malay Peninsula, and used in the same manner as the potato. Plants grown from tubers will not yield a crop the first season, but if grown from cuttings of the green portion of the stem, they will mature a crop within five months. When the leaves of the plant commence to fall the tubers may be dug and eaten.

54321. COLEUS ROTUNDIFOLIUS. From Mt. Silinda, Southern Rhodesia, Africa. Presented by Dr. W. L. Thompson. Native name **Zwidata**.

15395. COLOCASIA ESCULENTA. Trinidad Dasheen. From Trinidad, British West Indies. A variety of the taro which constitutes a valuable root crop for the South. The plant, related to the elephant-ear, which it resembles closely in general appearance, produces large corms and medium-sized tubers which are used like potatoes. When properly prepared and eaten hot, they have an attractive nutty flavor, suggesting roasted chestnuts. The corms and tubers, when cooked, are drier and more mealy than potatoes, and are found by chemical analysis to contain a greater percentage of protein and starch than does the potato. The young leaves make delicious greens, but when raw they are very acrid (like the Indian-turnip) and must first be parboiled with baking soda to remove the acidity. A rich loamy soil and a growing season of 7 to 8 months are required to mature a crop of dasheens. Special directions for growing and cooking will be furnished on application.

29327. COLOCASIA ESCULENTA. Penang Taro. From South China. This is one of the finest flavored of all known taros. Although closely related to the dasheen, the Penang taro differs from it in producing

elongated rather than oval corms, with none of the oval lateral tubers which in the dasheen are an important part of the crop. The tubers of the Penang are oddly shaped, and nearly all are very small. The white flesh of the corms and tubers is traversed by numerous, delicate, purple fibers; in cooking the coloring matter is dissolved and gives a pinkish hue to the flesh. While being baked, the Penang taro gives off a distinctive aroma of which one soon becomes exceedingly fond. This taro is even drier than the Trinidad dasheen; the corms and tubers are acrid when raw. This variety is not a good keeper, but its excellence as a table food has made it a favorite with nearly all who have eaten it. The culture is the same as that of the dasheen, but a slightly longer season is required for maturity.

47002. COLOCASIA ESCULENTA. Sacramento Dasheen. Originally from China. Grown from selected imported tubers obtained in Sacramento, Calif. A dasheen similar in leaf characters to the Trinidad variety, but with the bases of the leaf stalks and the buds of the corms and tubers much more reddish. Compared with the Trinidad dasheen the Sacramento produces fewer and larger tubers, and both corms and tubers are more regular in form. They are also usually lighter in color when cooked, less dry, and somewhat less flavorful. The corms do not always become mealy when cooked, and their quality needs to be ascertained by cooking tests by the grower each year. In other respects the Sacramento is a very promising variety for commercial cultivation.

47147. COLOCASIA sp. Taro. Of uncertain origin, -probably from the Orient. This taro resembles the Trinidad dasheen in its habit of developing oval cormels, or lateral tubers, but differs materially from it in several important respects: (1) It is a better keeper; (2) the lateral tubers rarely send up leaf-shoots, which makes the harvesting and cleaning of the crop easier; (3) the corms and tubers are much more moist and require a curing period of six or eight weeks after harvesting before they are entirely suitable for table use; (4) the flesh remains more nearly white when cooked; and (5) the flavor is even more mild than that of the Trinidad dasheen. In unsuitable soil the corms often lose the mealy-looking character. The culture is the same as for the dasheen. Because of the necessity for a curing period, this taro is to be considered mainly as one for late winter and spring use. Since it is less dry and firm than the Trinidad dasheen, and has less tendency to darken after cooking, it is believed that in its proper season this variety will prove very popular on the market. The lateral tubers are much better baked than boiled.

56085. CORNUS CAPITATA. Dogwood. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer, in the mountains of western China. A very handsome deciduous or partially evergreen flowering tree of bushy habit. As in the American flowering dogwood, the apparent petals are really large, showy, cream-white or yellow bracts 2 inches long, subtending the cluster of inconspicuous flowers. Before falling, the bracts turn ruddy. The fruit is a fleshy, strawberry-shaped, crimson head a little more than an inch wide, with yellow, sweet, and edible flesh, very popular in China where it is sold in the markets.

56302. **CORNUS CAPITATA.** Dogwood. From China. Collected by J. F. Rock, Agricultural Explorer.

53468. **COTONEASTER AFFINIS.** From India. Collected by J. F. Rock, Agricultural Explorer. A large shrub found in the Himalayas at 7,000 feet; it has beautiful flat clusters of white flowers and brown fruits. The strong elastic wood is used for walking-sticks.

52677. **COTONEASTER DAMMERI RADICANS.** From China. Presented by Vilmorin-Andrieux & Co., Paris, France. A prostrate variety which differs from the typical form also in having few-flowered clusters on long flowerstalks.

38760. **COTONEASTER FRIGIDA.** Presented by H. E. Huntington, Los Angeles, Calif. A strong-growing, large-leaved species native to the Himalayan slopes of northern India at altitudes of 7,000 to 10,000 feet. The numerous white flowers are followed by a profusion of strikingly attractive bright-red berries. This shrub has shown itself a desirable ornamental and will doubtless be grown more extensively in this country; it has already proved successful in California. It may be propagated from seed, by layering, or from cuttings.

56450. **COTONEASTER FRIGIDA.** From India. Presented by Hon. Vicary Gibbs, Elstree, Herts, England.

32935. **COTONEASTER MICROPHYLLA THYMIFOLIA.** Presented by Alwin Berger, La Mortola Botanic Garden, Ventimiglia, Italy. A dwarf, prostrate or trailing shrub native to the Himalayas of northern India, with persistent leaves, pinkish white flowers, and bright-red fruits. An attractive small plant suitable for rockeries.

54427. **CUCURBITA MOSCHATA.** Squash. From China. Presented by F. A. McClure, Canton. A very productive Chinese strain called **Faan kwa**. This large, round, yellowish green, ribbed squash is rather late in ripening.

56025. **CUCURBITA MOSCHATA.** Squash. From Libia, North Africa. Presented by E. O. Fenzi, who regards it as superior to any Italian or Californian squashes which he knows. This variety, of local origin, sometimes weighs as much as a hundred pounds. In Libia it is very popular on account of its sweet, fine-flavored, bright-colored flesh.

53610. **DENDROCALAMUS STRICTUS.** Bamboo. From India. Presented by R. S. Hole, Forest Botanist, Dehra Dun. This useful bamboo, which will grow on drier ground than most other species, is extensively employed in India for building purposes. The stems, usually solid, will attain a height of nearly 100 feet if grown on rich soil. The rhizomes or underground stems do not spread rapidly, and it is therefore easy to keep the plants in check, a condition which does not hold with many species. This bamboo will endure light frosts only; it should be tested in extreme southern Florida, and in favored spots on the west coast of that state.

56532. **DENDROCALAMUS STRICTUS.** Bamboo. From India. Presented by R. S. Hole, Forest Botanist, Dehra Dun.

56307. **DEUTZIA** sp. From China. Collected by J. F. Rock, Agricultural Explorer. A shrub of this handsome genus found upon the Likiang Snow Range, in Yunnan.

37943. **DIOSCOREA ALATA.** Greater, or Ten-month's Yam. A West Indian variety of the true yam, sparingly cultivated in Florida. It is not related to the sweet potato, some varieties of which are called yams. The tubers of this plant, which sometimes reach a weight of more than 10 pounds each, are white-fleshed, and in composition are similar to the white potato, from which they can scarcely be distinguished when properly cooked. Yam tubers, when carefully handled, may be stored for a long period without appreciable deterioration. For cultivation a deep mellow soil and a growing season of 9 to 10 months are required, but the plant is a handsome vine and may be grown for porch decoration where the season is much shorter. This yam deserves much wider cultivation in Florida for home use and for markets.

39705. **DIOSCOREA ALATA.** Guam Yam, or Dago Haya. From Guam. A variety of the greater yam with purple inner skin and white flesh sometimes slightly tinged with purple. The tubers are often large and of irregular shape. The flesh darkens somewhat when cooked, but possesses a rich flavor. The vine is easily distinguished from that of the preceding variety (No. 37943) by the reddish maroon color at each end of the petiole or leaf stalk.

46801. **DIOSCOREA ALATA.** Greater Yam. A West Indian variety of yam grown for several years near Miami, Fla. The tubers, which are white fleshed and drier than those of most varieties, are of good flavor though often rough and irregular in shape. Tubers sometimes reach a weight of 15 pounds in rich sandy loam or on well-drained muck soils.

45990)

47263)

49825) **DIOSCOREA ALATA.** Greater Yam.

54983)

Four commercial varieties (at present not separately identified) of yams of excellent quality from the West Indies. There are slight differences between them in shape or quality of tuber. They have been tested for several years in Florida and more recently in the Gulf regions of nearby states, and are shown to be suited for cultivation there in several types of deep and fairly rich loam soils. The vines are 4-angled and somewhat winged; they resemble those of S.P.I. No. 37943, but the tubers are of better quality. Yams of this class are much in demand on the market, and the commercial supply is as yet very inadequate.

13842. **DIOSPYROS KAKI.** Kaki or Japanese persimmon. Variety Mamegaki. Received from the Yokohama Nursery Company, Japan. A very good, late-keeping variety, the flesh of which is dark and nonastringent

when seedless. The fruit is spherical and pointed, with an average weight of about 6 ounces. This is one of the best of the dark-fleshed group of persimmons.

13846. DIOSPYROS KAKI. Kaki. Variety Shakumi. Received from the Yokohama Nursery Company. A short, oblong, laterally compressed four-seeded fruit which is $2\frac{1}{2}$ inches long. The color is dull red with a slight orange tint, the skin thin and tender. Whenever seeds occur the flesh is yellowish brown and nonastringent, but when seeds are absent it remains yellow and astringent until it becomes fully mature and soft. The quality is good. This variety may prove satisfactory for shipping purposes, and should be tested in those parts of the United States where kakis can successfully be grown.

22365. DIOSPYROS KAKI. Kaki. Variety Tamopan. From Chihli, China. Collected by Frank N. Meyer, Agricultural Explorer. This variety bears large flat fruits which have a characteristic constriction about midway between the middle and the stem end. The flesh is yellow and astringent until fully mature, when it softens and becomes palatable and of good quality. The skin is tough and firm so that the flesh can be eaten with a spoon from the half shell, even when the fruit is quite soft.

26491. DIOSPYROS KAKI. Kaki. Variety Fuyu. Secured through the Japan Nursery Company, from the region of Kobe, Japan. This is an excellent variety and will probably become one of the most important commercially. The flesh is yellow throughout, of good quality and never astringent. This is the only persimmon that can be eaten, while hard like an apple, at any time from October until after the Christmas season. When fully mature its color is red with a slight tinge of orange. In shape it is well adapted for shipping; being slightly flattened, it can be packed for shipment with little danger of injury and subsequent decay. It is believed that this variety will eventually extend the season and increase the consumption of persimmons in this country.

56088. DIOSPYROS LOTUS. Persimmon. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A spreading tree which grows to 50 feet in height, and bears small yellowish green persimmons of little value. It has been used extensively as a stock on which to graft cultivated varieties of *Diospyros kaki*, but the strains present in California have not proved altogether satisfactory for this purpose. In the hope that seed obtained from wild trees in southern China might furnish new strains of greater value, Mr. Rock has secured two numbers (this and 56089) from the mountains of Yunnan.

56089. DIOSPYROS LOTUS. Persimmon. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer.

56133. DIOSPYROS sp. Persimmon. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild fruit tree 20 to 25 feet high, which grows in dense forests between Menglieh and Manchi, at altitudes of about 6,000 feet. The numerous, oblong, yellow fruits are the size of small apples, and their taste is sweet and pleasant.

NOTE: This and the following four numbers have been introduced for testing as stock plants for the Japanese persimmon, *Diospyros kaki*. The rapid extension of orchard plantings of the latter fruit in California and Florida, together with the fact that *D. lotus*, much used as a stock plant, is proving unsatisfactory in some sections, has rendered essential the securing of new and better stocks.

56134. *DIOSPYROS* sp. Persimmon. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 35 feet high with few ascending branches, found on the summit ridge on the road from Hsiangta to Manchi, at an altitude of 7,000 feet. The oblong, velvety, rich yellow fruits are large for a wild species, being 2 inches in diameter; the very sweet flesh incloses large seeds.

56308. *DIOSPYROS* sp. Persimmon. From China. Collected by J. F. Rock, Agricultural Explorer. A tree 50 feet tall, with a huge crown of handsome appearance. Its yellow fruits are the size of cherries.

56309. *DIOSPYROS* sp. Persimmon. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This species grows as a tall spreading tree on dry slopes of the Likiang Mountains at 8,000 feet. The fruits are small, oval, and black.

56310. *DIOSPYROS* sp. Persimmon. From China. Collected by J. F. Rock, Agricultural Explorer. A large spreading tree which bears black, sweet, edible fruits, slightly over an inch in diameter.

52610. *DURANTA TRIACANTHA*. Chivo. From Ecuador. Collected by Wilson Popenoe, Agricultural Explorer. A handsome ornamental plant, indigenous in the ravines and on the hillsides about Ambato. It grows to a height of 15 feet and is heavily armed with stiff sharp thorns. Its pale-blue flowers, borne in clusters 3 or 4 inches long, are followed by golden berries half an inch in diameter. It should be sufficiently hardy for trial in California and Florida, where it may prove of value as a hedge plant.

43760. *EHRETIA MICROPHYLLA*. From Matania El Saff, Egypt. Presented by Alfred Bircher, Middle Egypt Botanic Station. A native of the Himalaya Mountains; it withstands, according to Mr. Bircher, 110° F. as well as light frosts. The flowers are white, and the shining, evergreen foliage and compact habit make it of value as a hedge or lawn ornamental.

56187. *ERYTHRINA TOMENTOSA*. From Australia. Presented by E. W. Bick, Brisbane, Queensland. A small leguminous tree native to South Africa. The foliage is trifoliolate and very handsome, and the many-flowered, spikelike clusters of crimson blossoms make the plant of interest for parks and lawns. The woody pods, which are alternately swollen and contracted, give the fruiting phase of the tree a bizarre appearance. Its cultivation will probably be confined to southern Florida and southern California.

56188. *ERYTHRINA VESPERTILIO*. Coral tree. From Australia. Pre-

sented by E. W. Bick, curator, Botanic Garden, Brisbane, Queensland. A small, armed tree with broadly 3-lobed leaves and numerous erect, showy spikes of red flowers. The soft, straw-colored wood is very light and spongy, and is used by the natives for making shields. The roots are said to be eaten raw. This tree should be tested as an ornamental in the milder regions of the United States.

54469. EUCALYPTUS GUNNII. Cider Eucalypt. From Tasmania. Presented by L. A. Evans, Acting Director of Agriculture. A tree about 50 feet high, growing in the Tasmanian Mountains. In spring an excellent cider is made from the sweet sap. The leaves are also sweetish and are browsed by stock. The bark yields a tannin used for softening leather and coloring it light brown and the wood is valued for fuel and charcoal. The species is fairly hardy and drought resistant.

54506. EUCALYPTUS OBLIQUA. From Hobart, Tasmania. Presented by L. A. Evans, Acting Director of Agriculture. A rapid-growing eucalypt which thrives on poor, stony ranges or on barren soils if not subjected to prolonged drought. The tree is known as "stringy bark" and "Tasmanian oak" and is much in demand for railway ties; the timber is almost everlasting and practically noninflammable, hence is a valuable construction wood for tunnels, underground railways, etc. It is also suitable for marine construction as it is immune from the attacks of shipworms and is one of the densest timbers of the world. Logs can be obtained in great lengths. The wood contains a resinous substance which resists *Xylophagus*, and an essential oil which prevents rotting under exposure to moisture.

56189. EUCALYPTUS RARIFLORA. From Australia. Presented by E. W. Bick, curator, Botanic Garden, Brisbane, Queensland. A tall eucalypt, rather scarce in northeastern Australia. The slender branchlets are of a pleasing red, and the variable leaves are almost circular on young trees, becoming very narrow on the older wood. The slender panicles contain usually a few scattered flowers. Suitable for cultivation in Florida and the Southwest.

54777. EUGENIA DOMBEYI. Grumichama. Presented by G. Regnard, Port Louis, Mauritius Island, Africa. A shapely attractive tree native to Brazil, attaining the size of an orange tree; it has handsome foliage and small white flowers which are followed in a month by the mature pendent deep-crimson fruits, the size of cherries. The skin is thin and delicate; the soft, melting, subacid flesh is usually eaten fresh but may also be used to make jam or preserves. Seedlings bear when four or five years old. In Florida this tree has withstood 26° F. without injury.

55978. EUGENIA DOMBEYI. Grumichama. Presented by Bro. Mathias Newell, Hilo, Hawaii.

54891. FICUS EHRETIoidES. Magura Fig. Presented by Dr. H. L. Lyon, Honolulu, Hawaii. A medium-sized tree native to Australia, having somewhat heart-shaped globular, edible fruits an inch in diameter. Introduced for trial in California and Florida as a garden and avenue tree.

32704. GARCINIA LIVINGSTONEI. Pembe. From East Africa. Presented by Pliny W. Keys, Inhambane. A small compact bush with stiff, very stout branchlets. The small white flowers are followed by elliptic fruits 2 inches long, orange yellow when fully ripe. The leathery skin encloses whitish, juicy flesh and two large seeds; the flavor is acid and aromatic. At Miami, Florida, this plant has proved to be hardy, and has borne fruit abundantly at an early age. It is of interest principally as a possible stock for the mangosteen.

54470. GARCINIA SPICATA. Received from the Yokohama Nursery Co., Japan. This medium-sized tree, native to the western peninsula of India, has small flowers in spikes and smooth deep-green fruits the size of walnuts. It is introduced as a possible stock for the mangosteen.

47358. GARCINIA TINCTORIA. From Cienfuegos, Cuba. Presented by R. M. Grey, Harvard Experiment Station. A rapid-growing evergreen tree from tropical Asia, bearing on the mature wood, singly or in clusters, orange-yellow fruits about 2 inches in diameter. The leathery skin encloses 3 to 5 segments of juicy flesh, each segment usually containing a large oblong seed. The flavor is rather acid. Introduced for trial as a stock plant on which to graft the mangosteen.

55105. GARCINIA TINCTORIA. Presented by Gerrit P. Wilder, Honolulu, Hawaii.

55454. GARCINIA TINCTORIA. Presented by H. S. Jones, Santa Fe, Isle of Pines, Cuba.

GARCINIA TINCTORIA. Presented by E. Lewis, Sabanda, Panama.

GARCINIA TINCTORIA. Presented by J. Zetek, Ancon, Canal Zone.

56823. GORDONIA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub about 8 feet high, found at an altitude of 6,000 feet near Tienyinssu. The flowers, which resemble those of the myrtle, are white and very large, with numerous stamens. Related to the well known Loblolly Bay of the southern United States, *Gordonia lasianthus*.

44433. GOURLIEA DECORTICANS SUBTROPICALIS. Chanar. From Oran, Salta, Argentina. Presented by S. W. Damon. A tall leguminous tree from northern Argentina with a crooked, tapering trunk about 4½ feet in diameter, and yellowish, coarse, soft wood. The variety *subtropicalis* differs from the typical species in the tapering trunk and the manner in which the bark peels off. It is likely to prove of value as a wind-break tree for mild-wintered regions.

51407. GUAIACUM GUATEMALENSE. Lignum-vitae. From Guatemala City. Secured through H. W. Goforth, American vice-consul. A small tree, reaching about 25 feet in height, native to the hot dry lowland plains of eastern Guatemala. It has a gnarled and twisted trunk, slender branches, delicate leaves, and in February and March is covered with small flowers of a delicate lavender-purple hue. The extremely

hard wood is used in cabinet work. In southern Florida the species has proved resistant to light frosts. It is recommended as a hedge and ornamental plant for that region. Its growth is slow, but the plants even when young are shapely and decorative in appearance.

50679. GUILIELMA UTILIS. Pejibaye Palm. From Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer. This remarkable palm is of ancient cultivation in Costa Rica and deserves wide dissemination in the Tropics. It is a beautiful pinnate-leaved species, with a slender trunk reaching not more than 50 feet in height. The fruits, of which as many as 5 or 6 stout racemes may be produced in a single crop, are top shaped, as much as 2 inches long, yellow to deep orange, with a hard seed in the center surrounded by an abundance of firm, orange-yellow, starchy flesh. After being boiled in salted water the flesh resembles that of the chestnut in texture and flavor. Recommended for testing in Porto Rico, Hawaii, the Philippines, and elsewhere throughout the Tropics.

55796. GUILIELMA UTILIS. Pejibaye Palm. From San Jose, Costa Rica. Received from Oton Jimenez.

55807. GUILIELMA UTILIS. Pejibaye Palm. From San Jose, Cost Rica. Collected by Edward Goucher, Plant Propagator.

55982. GUILIELMA UTILIS. Pejibaye Palm. From Limon, Costa Rica. Presented by C. P. Chittenden, manager, United Fruit Co.

56020. GUILIELMA UTILIS. Pejibaye Palm. From San Jose, Costa Rica. Received from Oton Jimenez.

56180. GUILIELMA UTILIS. Pejibaye Palm. From Limon, Costa Rica. Presented by C. P. Chittenden, manager, United Fruit Co.

HAEMATOTOXYLUM CAMPECHIANUM. Logwood or Campeche wood. Presented by M. E. Spencer, Palm Beach, Florida. A native of the American Tropics from southern Mexico to Venezuela. The wood yields an important commercial purple dye and ink as well as the chemical reagent haematoxylin. The timber is utilized in turning and the honey produced from the flowers is said to be of the finest quality. The tree attains a height of 40 feet, and its blossoms are handsome. Suitable for cultivation only in regions free from frost.

49168. HELIANTHUS ARGOPHYLLUS. Sunflower. From Victoria Falls, Rhodesia. Collected by Dr. H. L. Shantz, Agricultural Explorer. A handsome, ornamental, silver-leaved sunflower popular in cultivation at Beira and Lourenco Marques. It should be tested as a garden ornamental in the southernmost states.

49636. HIBISCUS sp. From Bukama, Belgian Congo. Collected by Dr. H. L. Shantz, Agricultural Explorer. A handsome garden ornamental which grows about a foot high. Its pretty pink flowers and low stature make it worth testing as a new and attractive border plant.

54973. HYLOCEREUS POLYRHIZUS. Pitahaya. From Guayaquil, Ecuador. Presented by F. W. Goding, American consul general. A triangular-stemmed cactus, very abundant on the coastal plain of Ecuador, where it may be seen climbing the trunks of trees by means of aerial roots. The roundish fruits, 5 to 7 inches long, have a thin, strawberry-red skin inclosing a mass of reddish, pleasantly acidulous pulp containing many small black seeds.

55754. HYPERICUM CANARIENSE. Presented by Dr. A. Robertson Proschowsky, Nice, France. A small graceful tree, with drooping branches and delicate foliage. In its native home, the Canary Islands, it is often seen on dry sterile soils. Its attractive yellow flowers, with clusters of long stamens, make it an ornamental plant worthy of trial in the Southwest.

39117. HYPERICUM OBLONGIFOLIUM. From Darjiling, India. Presented by G. H. Cave, director, Lloyd Botanic Garden. A shrub from the western temperate Himalayas, considered meritorious as an ornamental plant for its terminal clusters of large white flowers which turn yellow with age. Probably sufficiently hardy for cultivation on the Pacific Coast and perhaps also in the lower South.

24638. ILEX CORNUTA. Holly. From northern China. Presented by Rev. J. M. W. Farnham. This holly has spiny, dark-green, glossy leaves, and in winter is loaded with clusters of scarlet berries. While it does not make as symmetrical a crown as does the native Christmas holly, *Ilex opaca*, its attractive foliage and bright-colored fruits render it a fine winter ornamental for the Southern and Western States.

55489. ILEX PARAGUARIENSIS. Yerba Mate or Paraguay tea. From the territory of Misiones, Argentina. Presented by D. S. Bullock, Agricultural Trade Commissioner. In recent years yerba mate has attracted much attention in Europe and North America. In parts of Argentina, Uruguay, Paraguay, and Brazil it is the favorite drink, taking the place of both tea and coffee; unlike the former, it contains but little tannin. Its stimulating effect is due to the presence of small quantities of caffeine. When well prepared, it tastes much like the best green teas of the Orient; unlike them, however, water can be allowed to stand upon the leaves indefinitely without making the drink appreciably stronger. To prepare yerba mate for market, the leaves are slightly roasted, without, however, requiring the careful regulation of temperature necessary in preparing true teas.

A relative of yerba mate, known as cassina (*Ilex cassine*), occurs abundantly in the southern United States. It yields a tea scarcely distinguishable from mate. Furthermore, the plant is much hardier. For these reasons it seems unlikely that mate will become of commercial importance in this country. At best its cultivation would be limited to Florida, since the plant is susceptible to injury by temperatures below the freezing point. For tropical regions, mate may be recommended as worthy of cultivation, at least for home use.

51788. ILEX sp. Holly. From Sibate, Cundinamarca, Colombia. Collected by Wilson Popenoe, Agricultural Explorer. A small tree with

attractive foliage and quantities of berries which are first green, then cream-colored, then red, and finally, when ripe, almost black. The foliage is light green and very glossy, and the growth compact. It may prove of value as an ornamental in the Southern States and on the Pacific Coast. Young plants grown at Washington have attracted attention because of their decorative character. Worthy of trial as a pot plant for house culture.

56315. INDIGOFERA PENDULA. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. An ornamental leguminous shrub 10 to 15 feet high, with long racemes of bluish purple flowers. Native on the Likiang Snow Range at altitudes of 10,000 to 11,000 feet.

56811. IRIS sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A large and handsome flower of purplish blue color, found at altitudes of about 9,000 feet on the crater of the extinct volcano Tayinshan. It may prove useful to iris breeders, as well as being in itself an interesting and attractive species.

50662. JACQUINIA GRACILIS. From Guatemala. Collected by Wilson Popenoe, Agricultural Explorer. A small tree from the hot dry region of eastern Guatemala, where it is called duruche. It has stiff, dark-green leaves terminating in sharp spines, and bears an abundance of small fragrant yellow flowers. For trial as a hedge and ornamental plant in California and Florida.

56091. JUGLANS REGIA. Walnut. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. The walnut grows to great stature on the hills and slopes of Taipingpu, at an altitude of about 8,300 feet. The nuts, though of the same species known in the United States as the "English walnut," are very thick-shelled and difficult to break, and are gathered by the Chinese for the sake of their oil. This introduction is of interest mainly to those engaged in the development of new walnuts through breeding.

55484. JUNIPERUS PROCERA. East African Cedar. Presented by Prof. Charles Sprague Sargent, director of the Arnold Arboretum, Jamaica Plain, Mass. This tree, which Professor Sargent considers the handsomest of all junipers, is native to the mountainous regions of eastern tropical Africa, where it sometimes attains a height of 150 feet. It has a pyramidal head with upright or spreading, slender branches, and a sturdy trunk. The foliage is bluish, as are also the berries. It should be tested as an ornamental in the southern United States.

56316. KETELEERIA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A handsome coniferous tree 50 feet high, with light-green foliage and long oblong cones, found on the Sungkow Pass of the Hocking Range, at 11,000 feet altitude. This genus of the pine family is rare in cultivation in the United States where it should be tested in mild-wintered regions.

54549. KOPSIA ARBOREA. Presented by C. T. Simpson, Little River, Florida. Java is the native home of this handsome large shrub or small

tree whose attractive white flowers are followed by large brilliant-crimson, almond-shaped fruits. It is worthy of trial as an ornamental in the warmest portions of the United States.

55089. LIGUSTRUM DELAVAYANUM. Privet. Presented by Vilmorin-Andrieux & Co., Paris, France. A hardy shrub first discovered by Abbe Delway in the mountains of Yunnan, China. In habit it is prostrate-spreading, except for a few perfectly upright branches which rise from the center of the shrub to a height of about 10 feet. The shining dark-green foliage, which is remarkably persistent, is similar to that of myrtle, and the white flowers and blue-black fruits make the plant a handsome ornamental.

56317. LIGUSTRUM IONANDRUM. Privet. From Yunnan. Collected by J. F. Rock, Agricultural Explorer. A compact ornamental hedge shrub, 10 to 12 feet high, found among limestone boulders on the Likiang Snow Range at altitudes of 10,000 feet.

56318. LIGUSTRUM sp. Privet. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This species of privet, from water-courses on the Likiang Snow Range at altitudes of 8,500 feet, reaches the size of a small tree. Its small, fragrant, cream-colored flowers are borne in large compound clusters.

56824. LIGUSTRUM sp. Privet. From China. Collected by J. F. Rock, Agricultural Explorer. An ornamental shrub which grows among lava boulders in southwestern China at 6,000 feet altitude. The cream-colored flowers are in large pyramidal clusters.

56319. LITSEA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. An ornamental shrub with small axillary clusters of flowers. It is found on the Likiang Snow Range at an altitude of 11,000 feet.

37643. LONICERA CHRYSANTHA. Honeysuckle. From Petrograd, Russia. Presented by the former director of the Imperial Botanic Gardens. An early flowering species native to eastern Russia, which has been found hardy at the Arnold Arboretum, Massachusetts. Its dark-red fruits are very ornamental.

39697. LONICERA MAACKII PODOCARPA. Honeysuckle. From Nanking, China. Presented by Joseph Bailie, University of Nanking. An upright shrub native to northeastern Asia and central Japan where it occasionally reaches 15 feet in height. The large fragrant flowers are white, tinted rose, and the handsome fruit is dark red. This is remarkable as being the latest of the bush honeysuckles to bloom; the fruit and dark-green foliage last sometimes into late November.

55956. LONICERA XEROCALYX. Honeysuckle. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A rare shrub 15 to 20 feet high which grows on alpine meadows at an altitude of 12,000 feet. It has horizontal branches, narrow leaves of rich green, and large golden yellow flowers which appear in May and June. The small fruits of tomato-

red color are very ornamental.

56825. *LUCULIA* sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A handsome shrub 6 to 18 feet high which grows on the Shweli-Salwin Divide in rain forests at altitudes of 6,000 to 8,000 feet. The bright-green leaves have reddish stems and the rich-pink blossoms are in terminal clusters up to 6 inches wide. The individual flowers, nearly 2 inches across, are deliciously fragrant.

54082. *X MALUS ARNOLDIANA*. Apple. Presented by the Arnold Arboretum, Jamaica Plain, Mass. Seedlings of a hybrid of *M. floribunda* which originated in the Arboretum. Because of its large, pink, long-stemmed flowers and yellow fruits, the original hybrid is deemed a fine ornamental. The seedlings may, however, not reproduce the characters of the hybrid parent tree.

54266. *MALUS BACCATA*. Siberian Crab Apple. From Geneva, New York. Collected by H. C. Skeels, of this Office. Seedlings of S.P.I. 24366 grown in the orchard at the Geneva Experiment Station. This number was originally sent from the Arnold Arboretum, Jamaica Plain, Mass., by Jackson Dawson, who recommended it as a crab apple with unusual keeping qualities.

54083. *MALUS BACCATA JACKII*. Siberian Crab Apple. Presented by the Arnold Arboretum, Jamaica Plain, Mass. A handsome tree, native to Chosen, with pure-white flowers $1\frac{1}{2}$ inches across. The green leaves are whitened beneath, and the dark-red fruits are nearly an inch in diameter.

54085. *MALUS MICROMALUS*. Apple. Presented by the Arnold Arboretum, Jamaica Plain, Mass. This small tree, which is possibly of hybrid origin, has erect branches forming a pyramidal head. It bears a profusion of bright-red flowers and holds its small fruits well into the winter.

49038. *MALUS PRUNIFOLIA*. Apple. Cuttings collected by H. E. Allanson, at Rochester, New York. This was long considered to be a hybrid between the common apple and the Siberian crab; but, though not known outside of cultivation, it is now recognized as an independent species. The flowers are white and the green, yellow, or red fruits are about one inch in diameter.

54086. *MALUS PRUNIFOLIA RINKI*. Apple. Presented by the Arnold Arboretum, Jamaica Plain, Mass. A small tree native to China, with pink or pinkish white flowers which are in turn followed by yellow edible fruits often 2 inches in diameter. This apple is not common in cultivation and should prove of interest to horticulturists.

53380. *MALUS PUMILA*. Paradise Apple. Presented by Joseph Mazanek, Bohemia, Czechoslovakia. A bushy apple growing usually about 5 feet in height. It is native to the Caucasus, whence it has been introduced to western Europe and is now used there extensively as a dwarfing stock for apples.

54087. **MALUS ROBUSTA.** (*baccata* x *prunifolia*). Presented by the Arnold Arboretum, Jamaica Plain, Mass. An interesting hybrid with very ornamental flowers, considered promising as a stock for other kinds of apples.

10345. **MALUS SYLVESTRIS.** Apple. From the Crimea, Russia. Presented without notes by Theophil Kalaida, former head gardener of the Imperial Garden at Nikita.

27061. **MALUS SYLVESTRIS.** Apple. From the Caucasus, Russia. Collected by Frank N. Meyer, Agricultural Explorer. A Circassian apple obtained originally from a native prince. The flavor is said to be very fine, and it has shown good bearing qualities in this country.

27153. **MALUS SYLVESTRIS.** Apple. From the Caucasus, Russia. Collected by Frank N. Meyer, Agricultural Explorer. An unusually large, irregular fruit with a pale-green skin. The flesh is very white and dryish with a pleasant subacid flavor.

30229. **MALUS SYLVESTRIS.** Helm Apple. Presented by Dr. F. R. Ramsdell, Columbia, Isle of Pines. A variety which originated as a seedling in Lee County, Texas. The fruits are of large size and handsome color; the flesh is tender, juicy, and sweet. This is a good apple for warm climates.

31653. **MALUS SYLVESTRIS.** Wainwright Apple. From Maritzburg, Natal, South Africa. Presented by W. J. Newberry, curator, Botanic Gardens. Reported to be a prolific bearer, whose fruits are small but attractive in appearance, and excellent for eating and cooking.

35638. **MALUS SYLVESTRIS.** Apple. Received from Svend Lange, Novo Nikolayefsk, Russia. A seedling of the Oporto, originated in the Crimea. Reported to be a fruit of good size and bright-red color with firm, sweet flesh.

39829. **MALUS SYLVESTRIS.** Limoncella Apple. From Naples, Italy. Presented by Dr. Gustavus Eisen. A variety adapted to the hot and dry climate of southern Italy and Sicily, where it is considered the best for general market purposes. The fruit is rather small, somewhat pyramidal in shape, and much longer than wide. Its pronounced and agreeable flavor is said to resemble that of certain red Cabernet grapes.

43154. **MALUS SYLVESTRIS.** Climax Apple. A dessert apple from New Zealand. Presented by H. R. Wright.

43155. **MALUS SYLVESTRIS.** Coldstream Guards Apple. From New Zealand. Plants presented by H. R. Wright. This apple, which is recommended by Mr. Wright as a first-class summer dessert variety, is of medium to large size, smooth, round, bright colored and very attractive in appearance, resembling closely the Red Astrakhan. The tree is hardy, healthy, and a heavy bearer. No fruits have yet been produced in this country.

43156. MALUS SYLVESTRIS. Cole's Blushing Bride Apple. From New Zealand. Plants presented by H. R. Wright, who describes it as a desert apple of conical shape, medium size and handsome appearance. It is a heavy bearer and is claimed to be blight resistant.

43157. MALUS SYLVESTRIS. Diadem Apple. From New Zealand. Plants presented by H. R. Wright. A handsome large fruit with light-red skin and cream-white flesh of good texture and pleasing flavor. Fruits ripened at the Plant Introduction Garden, Chico, Calif., about August 30. This variety promises to be a valuable addition to the late summer apples grown in this country. It is excellent both as a dessert and as a cooking apple.

43160. MALUS SYLVESTRIS. George Neilson Apple. From New Zealand. Presented by H. R. Wright. A large early apple, resembling Red Astrakhan, of which it is said to be an improvement. It is claimed to be blight resistant.

43174. MALUS SYLVESTRIS. Willie Sharp Apple. From New Zealand. Plants presented by H. R. Wright. The fruit of this variety is described as medium-sized, with yellow skin and crisp flesh of vinous flavor. It is a dessert apple of handsome appearance. Not yet tested in this country.

54389. MALUS SYLVESTRIS. Imm's Seedling Apple. From New Zealand. Root grafts presented by H. R. Wright. A large cooking apple, said to be one of the best for that purpose. The tree, which is of upright growth, and makes a strong root system, bears well, and is claimed to be aphid resistant.

54636. MALUS SYLVESTRIS. Bella Rosa Apple. From Chile. Plants presented by Sr. don Salvador Izquierdo through Wilson Popenoe, Agricultural Explorer. A medium-sized apple with firm, sweet flesh. In Chile it is immune to attacks of woolly aphid and is introduced in the United States for trial as a root stock for other apples.

54637. MALUS SYLVESTRIS. Chestnut Apple. From Chile. Plants presented by Sr. don Salvador Izquierdo through Wilson Popenoe, Agricultural Explorer. A medium-sized fruit for fall and winter use. Its chief interest lies in its immunity in Chile to the attacks of woolly aphid, and it is introduced principally for trial as a root stock.

54647. MALUS SYLVESTRIS. Apple. From Chile. Presented by the Instituto Agrícola Bunster, through Wilson Popenoe, Agricultural Explorer. An apple known as Huidobro, and Araucana Huidobro. It is said to have originated in the hacienda of Sr. Vicente Huidobro, from an Italian seed. The tree is described as very vigorous and productive, the fruit medium-sized, yellow, of firm texture, and very sweet flavor. Its ripening season is late autumn (April to May in Chile) and the fruits can be kept in good condition without cold storage until the following October or November. It is not a good dessert apple, but in its native home is immune from the woolly aphid, and may prove of value as a root stock for other varieties.

56321. MALUS YUNNANENSIS. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 30 to 40 feet high which grows among limestone boulders along watercourses on the Likiang Snow Range at altitudes of 10,000 to 12,000 feet. The yellowish crimson fruits, about one inch in diameter, are borne in large clusters.

54093. MALUS ZUMI. Dwarf Apple. Presented by the Arnold Arboretum, Jamaica Plain, Mass. A low and much-branched tree native to the mountains of central Japan. It reaches a maximum height of 20 feet, and has a twiggy growth forming a compact rounded head. The pinkish flowers are borne in great profusion and are followed by red fruits. This number, 54093, is said to be a large-fruited form. It is recommended for trial as a stock plant.

54267. MALUS sp. Apple. Collected by H. C. Skeels of this Office at the Geneva Experiment Station, New York. Seedlings of S.P.I. No. 21065, a crab apple originally sent from Kirin, Manchuria, by Frank N. Meyer, Agricultural Explorer.

55817. MALUS sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. In the vicinity of Likiang this tree, growing 40 feet high, is found wild and semicultivated. The handsome fruits, about 2 inches in diameter, are bright crimson shading to yellow. The flesh is firm, with an acidulous flavor and not mealy in texture.

NOTE. The attention of plant breeders and horticulturists is directed to this and the following numbers of *Malus*, collected in Yunnan by Agricultural Explorer Joseph F. Rock. These plants have been introduced not only with the object of furnishing new ornamental forms of this popular genus, but more particularly with a view to securing new and valuable stock plants on which to graft cultivated apples, and to supply plant breeders with material to utilize in hybridizing with forms already known in the United States. The collection of *Malus* offered in this season's Descriptive List is probably the most remarkable which the Office of Foreign Seed and Plant Introduction has ever secured.

55889. MALUS sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A large, vigorous tree, growing wild and semicultivated. The fruits, about the size of walnuts, are bright crimson with yellow cheeks and are quite ornamental. The flesh is acid-sweet and very palatable as well as being excellent for jam and jelly.

56092. MALUS sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This large tree with ascending branches is found in the mountains near Taipingpu, at an altitude of 8,200 feet. The fruits have yellowish green skins and are about 2 inches in diameter. The flesh is pleasantly aromatic though sour to the taste.

56093. MALUS sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This apple is wild in the Yangpi Mountains, where it grows at an altitude of 7,800 feet. The fruits are of handsome appearance with bright-red and yellow skins.

56094. *MALUS* sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This tree, 30 feet high with a trunk 2 to 2½ feet in diameter and straight ascending branches, is found wild in red clayey soil on the mountains between Yangpi and Taipingpu, at an altitude of 8,000 feet. The very numerous fruits, the size of small apples, are yellowish with a bright-red tinge. They have firm, very aromatic, but sour flesh.

56136. *MALUS* sp. Apple. From Yunnan, China. Collected by Miss Clara Peterson for J. F. Rock, Agricultural Explorer. In the mountains near Puerhfu, at an altitude of about 6,000 feet, this apple grows wild. Its fruits are small, hard and sour.

56275. *MALUS* sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 30 to 40 feet high, occurring wild along watercourses in the Kuyung Mountains north of Tengyueh, at an altitude of 7,000 feet.

56322. *MALUS* sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This species reaches heights of 60 to 80 feet and has stout straight branches. It grows on the slopes of the Likiang Snow Range at altitudes of about 12,000 feet. The dark-green leaves are very handsome, being silvery beneath, and the oval, yellow fruits have sour, aromatic flesh and large seeds. The tree is strikingly ornamental.

56325. *MALUS* sp. Apple. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A low-growing tree 15 to 20 feet in height, found in dense forests on the Salwin Ridge at altitudes of about 8,000 feet. The leaves are ornamental and conspicuous with their red veins and leaf-stalks. The oval, yellow, acid fruits are tipped with a persistent beaklike calyx.

56474. *MALUS* sp. Apple. From Yunnan, China. Collected by Miss Clara Peterson for J. F. Rock, Agricultural Explorer. A wild apple which grows at an altitude of 6,000 feet. The small, globose fruits are yellowish with a tinge of pink on the side exposed to the sun.

56475. *MALUS* sp. Apple. From Yunnan, China. Collected by Miss Clara Peterson and presented to J. F. Rock, Agricultural Explorer. A wild apple tree obtained from the hills at an altitude of 6,000 feet.

29505. *MANGIFERA INDICA*. Borsha Mango. From India. Received from William Burns, Economic Botanist to the government of Bombay. This has proved to be one of the finest Indian mangos yet fruited in Florida. In general character it strongly resembles Mulgoba; the fruits are oblong, slightly pointed toward the lower end, about 12 ounces in weight, the surface bright yellow, washed with crimson on the side exposed to the sun. The yellow flesh is entirely free from fiber, and has a rich, aromatic flavor. The tree gives promise of bearing more regularly than Mulgoba. It is worthy of trial in all mango-growing regions.

42463. *MARANTA ARUNDINACEA*. West Indian Arrowroot. From Jamaica.

Presented by W. Harris, superintendent, Hope Gardens. A rather small, white-flowered plant which is cultivated in the West Indies for its clusters of white, shiny, thin-skinned tubers, from which is obtained about 20 per cent, by weight, of starch. West Indian arrowroot, as the raw product is called, is over 80 per cent pure starch, and is much used as an ingredient of certain infant foods. The plant succeeds in the Gulf States and Florida, and is not difficult to cultivate. The roots are planted in the spring at a distance of about a foot and a half apart, and as the plants grow they are mounded up like potatoes. Rich soil and plenty of water are essential. In the autumn the tubers are harvested, a growing season of about ten months being required.

55936. MELIOSMA CUNEIFOLIA. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A beautiful flowering shrub or small tree 12 feet high, found growing among limestone boulders at altitudes of 9,000 to 10,000 feet along watercourses on the northern end of the Likiang Snow Range. In habit it resembles the weeping willow, with drooping branches bearing near their ends large pyramidal clusters of cream-colored flowers.

30330. MORUS NIGRA. Black Mulberry. From Khotan, Sinkiang. Collected by Frank N. Meyer, Agricultural Explorer. The berries are large, dark violet-black in color, and have a fresh, subacid taste. They ripen from early August until the end of September. Recommended as a home fruit in desert regions under irrigation.

56785. MUSA GILLETII. Banana. From Kisantu, Belgian Congo, Africa. Presented by Pere J. Gillet. This species, which is a close relative of the Abyssinian banana, *Musa ensete*, grows about 6 feet high, with the lower leaves reaching a length of 5 feet. The upper leaves become smaller until they merge into the floral bracts. The fruits are oblong and somewhat pear shaped, 2 inches in length, with a grayish, warty surface, shiny black seeds, and powdery pulp.

55735. MYRICA RUBRA. From Japan. Received from the Yokohama Nursery Company. An evergreen tree native to eastern Asia, called yang mae in China. The beautiful, dark-purple fruits average from one to one and a quarter inches in diameter and can be eaten out of hand or made into compotes and pies. There is great variation in the productivity of the trees, as well as in the size, color, and flavor of the fruits which generally taste of strawberry and lemon.

56487. NATHUSIA ALATA. From Loanda, Angola, Africa. Presented by John Gossweiler. A tree of moderate size, native to Abyssinia and parts of British East Africa, with curious winged stems and small white flowers tinged with lilac. The timber is very hard. It is suggested as an ornamental shade tree for the warmer portions of the United States.

44709. OLEA EUROPAEA. Fayum Olive. From Egypt. Presented by Thomas W. Brown, Director, Horticultural Division, Ministry of Agriculture, Cairo. The tefahi or "apple olive" is considered the best of the three varieties grown in Fayum. Though reputed to be only moderately productive, its large size and fine appearance cause it to be in

great demand throughout the Egyptian Delta. As the flesh is very soft and buttery when fully ripe, it is marketed as soon as it begins to color (about November 1). The fruit is a deep purplish black with lilac bloom, 2 inches long, $1\frac{1}{2}$ inches broad (maximum), broadly oval with a blunt tip terminating in a short, sharp point. There is a rather deep cavity around the stalk and some fruits show a slight fold. The flesh is about $\frac{1}{3}$ inch thick; the pit is large, rough, with deep longitudinal furrows. It seems probable from the history of the culture of this tree and the remains of ancient oil mills, that this variety was used for olive oil as long ago as the Roman occupation of Egypt.

55465. ONCOBA ECHINATA. Gorli shrub. From Sierra Leone, Africa. Received from L. A. King Church, conservator of forests, Freetown. Chaulmoogric acid, used successfully in the treatment of leprosy, has been obtained commercially only from certain Asiatic trees, of which the most important are *Taraktogenos kurzii*, *Hydnocarpus anthelminthica*, and *H. wightiana*. These are all slow growing, and require many years to produce the fruits from which chaulmoogric acid is secured. In order to meet the increasing demand for this substance, a plant which requires fewer years to come into bearing is desired. *Oncoba echinata* may meet this requirement; it is described as a shrub which fruits within a few years of planting, and whose seeds contain 46.6% of fat, of which 87.5% is chaulmoogric acid, according to an analysis made at the Imperial Institute by Goulding and Akers. The cultural requirements of *Oncoba* are not definitely known, but it is believed the plant may succeed as far north as southern Florida. It should be tested in all tropical regions where leprosy is present.

46619. ONOSERIS SPECIOSA. From Huigra, Ecuador. Collected by J. N. Rose, associate curator, United States National Herbarium. A low-growing composite with large flower-heads having long, handsome, sky-blue rays and golden centers. Promising as an ornamental plant for pot culture.

48720. OPHIOPOGON JAPONICUS. From Mogi, Japan. Collected by J. B. Norton, Agricultural Explorer. A low-growing grasslike plant which stands prolonged drought and will succeed on ground heavily shaded by trees.

55992. OSTEOMELES SCHWERINAE. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A spreading shrub of the apple family, 2 to 3 feet high, found in the Langchiung Mountains at an altitude of 7,500 feet. The flowers are pinkish white and very fragrant; the sweet, edible fruits are dull purple.

47748. OXYSPORA PANICULATA. From Darjiling, India. Presented by G. H. Cave, director, Lloyd Botanic Garden. A spreading shrub with drooping branches terminated by large loose clusters of rose-purple flowers. It is native to the Himalayas of Bhutan and Nepal.

55629. PANDANUS TECTORIUS. Screw Pine. From the Island of Hainan, China. Presented by F. A. McClure, Canton Christian College. A handsome ornamental hedge plant used extensively in Hainan, where it

reaches a height of about 12 feet. For trial in subtropical regions of the United States.

55509. PERSEA AMERICANA. Collinson Avocado. A seedling of the Collins avocado, originated at the Plant Introduction Garden, Miami, Florida. It is generally considered to be a hybrid, the seed-parent (Collins) being a Guatemalan, and the pollen-parent an unknown West Indian variety. Because of its vigorous growth, free-bearing habit, and good quality of fruit, it is looked upon as commercially promising, and is being planted extensively in Florida orchards. The fruit, which matures at Miami in January, is broadly oval to round, 16 to 24 ounces in weight, glossy green, smooth-skinned, and very attractive in appearance. The seed is rather large, tight in the cavity, and the yellow flesh which is devoid of fiber markings, is rich and nutty in flavor. The tree is a much stronger grower than most of the Guatemalan varieties, and promises to fruit more regularly.

55736. PERSEA AMERICANA. Itzamna Avocado. Budwood sent from Guatemala by Wilson Popenoe, Agricultural Explorer. This is the best late-ripening Guatemalan avocado yet tested at the Plant Introduction Garden, Miami, Florida. The tree is a strong grower, shapely, with stiff branches. Up to the present it has borne regularly, its behavior in this regard being much more satisfactory than that of many other Guatemalan varieties. The fruit, which matures at Miami from March to early May, is slender pyriform, 14 to 18 ounces in weight, dark green and somewhat rough on the surface. The flesh is deep yellow, free from discoloration or fiber, smooth, very dry, and of rich, nutty flavor. The seed is medium-sized and tight in the cavity.

54767. PHOENIX OUSELEYANA. From Calcutta, India. Presented by Percy Lancaster, secretary, Agricultural and Horticultural Society of India. An armed palm with a stem 9 inches thick, reaching only 12 feet in height. The fruits are orange-colored until fully ripe; when they turn black they are edible. Native to the southern slopes of the Himalayas.

55611. PHOENIX sp. From Nice, France. Presented by Dr. A. Robertson Proschowsky. This and the following numbers from Dr. Proschowsky represent hybrids which have originated on the Riviera, the parents being several species of Phoenix which are cultivated as ornamental plants in that region. They are worthy of trial in those portions of the United States where the temperature does not go below 20° F.

55612. PHOENIX sp. (as above)

55613. PHOENIX sp. (as above)

55614. PHOENIX sp. (as above)

55615. PHOENIX sp. (as above)

56276. PHOTINIA sp. From China. Collected by J. F. Rock, Agricultural Explorer. A tall-growing tree of the rose family, with a dense

crown, found in the Kuyung Mountains at an altitude of 6,000 feet. The flowers, said to be white, are borne in large masses about 5 inches across, and are succeeded later in the season by the deep orange-red fruits. It should be tried as an ornamental shade tree.

56331. PHOTINIA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. An ornamental shrub 5 to 6 feet high, found in limestone alpine meadows of the Likiang Snow Range. Its clusters of dark-carmine, applelike fruits constitute its chief attraction.

56779. PHOTINIA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 30 to 40 feet high, found on the plain and hills near Mengka, at 5,000 to 6,000 feet altitude. The flowers, said to be white, are in large masses 5 inches across. In China this tree is laden in November with deep orange-red, applelike fruits.

55975. PHYLLOSTACHYS AUREA. Golden Bamboo. Presented by J. H. de LeHaie, Mons, Belgium. A handsome ornamental form, fairly hardy, and grown rather widely. It is said to be quite drought resistant and with a little protection will survive the winters as far north as Washington, D. C. It reaches a height of about 15 feet. The chief ornamental attraction of this species is its golden stems. The leaves are but 2 to 4 inches long and grayish beneath. This was one of the earliest forms to be introduced in California and is frequently seen there.

24760. PHYLLOSTACHYS BAMBUSOIDES. Bamboo. From Nagasaki, Japan. Secured by Wm. D. Hills, Agricultural Explorer. (See S.P.I. 40851). A striking bamboo growing to a height of 40 to 60 feet. The culms are strong and straight and, when properly cured and handled, will be found useful for many purposes on the farm and around the home. Light fences, gates, fishing poles, broom, hoe and other implement handles may be made from them. It must be borne in mind that bamboos of this type do not attain their full size at once. It will require at least ten years on good soil for this plant to begin to develop stems 25 to 30 feet high. The older the clumps or plantings the larger the stems or culms. This species is suitable for planting in the South Atlantic and Gulf States, also on the Pacific Coast in protected places as far north as Portland, Oregon. It will thrive best when planted in clumps or groups. The plants spread by means of underground stems or rhizomes, which, if not disturbed, are quite aggressive, invading roadways, pushing their way under buildings and sometimes, although not often, becoming more or less of a nuisance. Many southern farms would find patches of one-eighth to one-quarter of an acre of this bamboo a valuable asset as a run for chickens and as a source of many useful and helpful conveniences.

40851. PHYLLOSTACHYS BAMBUSOIDES. Bamboo. Introduced by Andreas Moynelo, who made the original planting near Burroughs, Georgia. This form seems to differ in no essential character from the Japanese timber bamboo described under S.P.I. 24760. The culms reach a height of 60 feet or more, and with their plumelike foliage are highly ornamental. Although not considered in Japan as palatable as those of *P. pubescens*, the young shoots furnish a delicious early vegetable.

12180. PHYLLOSTACHYS BAMBUSOIDES. Bamboo. From Japan. Received from the Yokohama Nursery Company. (See S.P.I. No. 24760).

23234. PHYLLOSTACHYS NEVINII HUPEHENSIS. Bamboo. From Chekiang, China. Collected by Frank N. Meyer, Agricultural Explorer. The horticultural differences between this bamboo and S.P.I. No. 55713 are so slight as to be scarcely distinguishable. The plants were originally introduced under separate inventory numbers and for convenience of record are kept separate. A sturdy grower, sending up stems or culms at the end of ten or twelve years to a height of 12 to 14 feet. It should be handled and may be utilized as described for Nos. 55713 and 23261.

23261. PHYLLOSTACHYS sp. Bamboo. From Fengtai, Chihli, China. Collected by Frank N. Meyer, Agricultural Explorer. A rapid growing and aggressive bamboo much like S.P.I. No. 55713. It is one of the earliest bamboos to start in the spring, but, notwithstanding this fact, it seems able to resist considerable cold. With little protection, it can be grown as far north as Washington, D. C. Its economic uses are the same as for S.P.I. No. 55713. The plant likes company, and isolated specimens develop slowly, so that it is best whenever practicable to set ten or more plants together, in order to induce thicketlike groves.

55713. PHYLLOSTACHYS sp. Bamboo. From Chekiang, China. Collected by Frank N. Meyer, Agricultural Explorer. A medium-sized, rather slow-growing bamboo which does not have such precise soil requirements as do some of the larger types. Plantings ten to twelve years old on rather poor soil at Brooksville, Florida, are now twelve to fifteen feet in height. The culms or stems are straight, hard, wiry, and, when fully matured and ripened, are of a greenish yellow color. The type begins to develop fair-sized canes when five or six years old; these will be found useful for many purposes, including plant stakes, bean poles, trellises, etc. This bamboo thrives best when allowed to form thickets or clumps. It withstands considerable frost and is well adapted to the region along the Atlantic Coast, from Washington southward and westward in the Gulf Coast States. It is also worthy of trial in the irrigated sections of California.

45914. PINUS ARMANDI. Pine. From the Island of Taiwan, Japan. Presented by G. Takata, director, Department of Productive Industries, Taiwan. This tree with its straight trunk 90 feet tall is remarkable for producing very large cones which bear large edible seeds.

56333. PINUS ARMANDI. Pine. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. Common at altitudes above 8,000 feet in the northern part of Yunnan.

21970. PISTACIA CHINENSIS. Chinese Pistache. From Shantung, China. Collected by Frank N. Meyer, Agricultural Explorer. A very fine ornamental tree suited to the mild-wintered regions of the Southwest. It is long-lived and adapted to avenue planting. Its handsome pinnate foliage, which turns red in autumn, resembles sumach and Sophora. The seeds yield an oil used for cooking. The very hard wood is free from insect attacks and is employed in furniture making. It is said that

the leaf buds, boiled like spinach, are eaten by the Chinese.

49746. PITHECOLOBIUM TORTUM. Black-bead Tree. From Guatemala. Collected by Wilson Popenoe, Agricultural Explorer. A handsome medium-sized tree, producing an abundance of small, feathery yellow flowers, followed by curious leguminous fruits. In Guatemala, where it is called *aripin*, it blooms during the winter. It should be tested in the warmest sections of the United States.

57273. PITTOSPORUM FLORIBUNDUM. Presented by G. H. Cave, director, Lloyd Botanic Garden, Darjiling, India. An ornamental tree from the subtropical Himalayas with a short, straight trunk, spreading branches, and terminal clusters of fragrant yellowish flowers. It yields a yellow oleoresin with powerful adhesive qualities. The bitter, aromatic bark is used in India as a narcotic drug.

56826. PITTOSPORUM sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shapely tree about 30 or 40 feet in height, with handsome foliage, and large terminal masses of cream-colored flowers followed by bright-red fruits.

55920. PLOCAMA PENDULA. From the Canary Islands. Collected by David Fairchild, Agricultural Explorer. A low-growing shrub, found on arid hillsides in the Canary Islands. It has a beautiful weeping habit, giving the plants the appearance of tiny weeping willows not over 3 feet high. It is able to withstand severe drought.

55939. POLYGALA ARILLATA. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A rare ornamental shrub 3 to 4 feet high, found on mountain slopes at an altitude of 7,000 feet. The bright-yellow flowers are borne in long spikes.

51877. POPULUS MAXIMOWICZII. Poplar. Presented by John Dunbar, assistant superintendent, Department of Parks, Rochester, N. Y. A very fast-growing and stately tree native to China. It will succeed in the coldest portions of the United States on the poorest and driest soils. At all times it makes phenomenally rapid growth. Its leaves, which are handsomely crinkled like those of *Rosa rugosa* appear very early in the spring and remain longer in the autumn than those of almost any other deciduous plant. The tree is not attacked by borers or leaf-eating insects; it is highly recommended as a shade tree and windbreak generally, especially for the northwest plains country.

48510. PORTULACARIA AFRA. Spek-boom. From Johannesburg, Transvaal, South Africa. A succulent South African shrub, rising to 12 feet, which affords locally the principal food for grazing elephants, but it is also well liked by sheep, and it should for this reason be tested in the southwestern United States on stony ridges and semiarid land, to which it is well adapted by reason of its cactuslike habit of storing water.

PORTULACARIA AFRA. Spek-boom. Presented by Miss K. O. Sessions, San Diego, Calif.

55921. POSOQUERIA LATIFOLIA. From Ancon, Canal Zone. Presented by James Zetek. A shrub sometimes 25 feet high, native to the forests of northern Bahia, Brazil, where it grows in sandy soil with but little water. It flowers there in February and its succulent fruits which ripen in July are sold in the markets for making marmalade and jelly. The chief value of the shrub, however, lies in the finely grooved, rigid branches which are highly prized for fancy walking sticks and are exported to England where they are fashionable under the name of "Brazilian Oak." The shrub is ornamental by reason of its showy white flowers which have a perfume somewhat like that of the orange jessamine.

55995. PRIMULA BULLEYANA. Primrose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A very beautiful primrose found on the Likiang Snow Range in pine forests at altitudes of 9,000 to 11,000 feet.

56334. PRIMULA FORRESTII. Primrose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A perennial primrose found among rocks and under trees in rich soil and among limestone boulders of the Likiang Snow Range at altitudes of 11,000 to 12,000 feet. The large basal leaves have a fresh-apple odor; the flowers are rich orange yellow. An attractive plant for the rock garden.

34265. PRUNUS ARMENIACA. Apricot. From Rome, Italy. Presented by Gustavus Eisen. A variety said to be a favorite in the vicinity of Frascati, in the Alban Hills near Rome. The fruits, which average 9 to 10 per pound, are large, elongated, and yellow. They have a deep narrow stem cavity, and a rather deep suture, dividing them into unequal halves; the pit is large and free from the flesh which is of decidedly good flavor. The fruits ship well and are valued for drying.

40223. PRUNUS BOKHARIENSIS. Plum. From Seharunpur, India. Presented by A. C. Hartless, superintendent, Government Botanical Garden. A plum cultivated in northern India, interesting but too small-fruited for commercial use in the United States. The tree resists drought, and is very attractive when in bloom. Its red fruits, scarcely an inch long, are pleasantly flavored. The species merits planting as a doorway tree in the Southwest.

40229. PRUNUS BOKHARIENSIS. Plum. From Seharunpur, India. Presented by A. C. Hartless, superintendent, Government Botanic Garden.

40498. PRUNUS DOMESTICA. Papagone Prune. From Naples, Italy. Presented by Dr. Gustavus Eisen. The fruit is large, oval, elongated, greenish yellow, $2\frac{1}{4}$ by $1\frac{3}{8}$ inches, slightly bottle-necked, the stem cavity shallow, the suture only a line; the pit is long, narrow, and rough, free from the coarse, sweet flesh. The skin splits rather easily.

54722. PRUNUS MUME. Japanese Apricot. Variety Shira Kagi. From Okitsu, Shizuokaken, Japan. Budwood presented by Prof. T. Onda, Bureau of Horticulture, Imperial Agricultural Experiment Station. The mume

or Japanese apricot, which grows normally 15 to 20 feet high, is on account of its beautiful branching habit and lovely blossoms the favorite flower of Japanese poets and painters, as the flowering cherry is the favorite flower of the Japanese people. The mume has been confused with the flowering plums and cherries, but it is in reality an apricot, although its fruits are among the sourest known. In pickled form, however, they are one of the most popular of Japanese relishes. Near Washington, D. C. 15 varieties of mume have been tested, of which 10 have survived the winters of that latitude. The variety introduced under this number is described as having large, pure-white, late-blooming flowers.

54725. PRUNUS MUME. Japanese Apricot. Variety Yaro. From Okitsu, Shizuokaken, Japan. Budwood presented by Prof. T. Onda, Bureau of Horticulture, Imperial Agricultural Experiment Station. A variety producing small, light-red flowers and medium-sized fruits. It blossoms later than many others.

51881. PRUNUS MUNSONIANA. Plum. Presented by John Dunbar, assistant superintendent, Department of Parks, Rochester, N. Y. A native fruit tree of the Southwestern States from which have been developed under cultivation such commercial varieties as Arkansas, Wild Goose, Downing, etc. The bark is grayish brown, shaggy and furrowed; the branches are zigzag and seldom thorny. Late in the spring the flowers appear on the leafless lateral spurs. The round, bright currant-red clingstone fruits, an inch in diameter with conspicuous whitish dots, ripen early and have yellow, juicy, melting flesh which is fibrous, sweetish, aromatic and of good flavor. Considering its juiciness, the fruit ships and keeps well. The tree grows vigorously and is hardy as far north as central New York.

43176. PRUNUS SALICINA. Alpha Plum. From New Zealand. Presented by H. R. Wright. An oblong fruit, belonging to the Japanese group, with yellow cheeks blushed with light or dark red, and firm golden flesh, juicy and of delightful flavor. It appears to be an excellent keeper and shipper. The stone clings to the flesh.

43180. PRUNUS SALICINA. Wright's Early Plum. From New Zealand. Presented by H. R. Wright. A firm-fleshed plum of medium size, weighing 16 fruits per pound. The flesh is yellow and of the flavor of *Prunus simonii*. The stem is rather weak, the basin small and shallow, and the suture pronounced. It is a very attractive, red-skinned variety belonging to the Japanese group.

43181. PRUNUS SALICINA. Wright's Purple Plum. From New Zealand. Presented by H. R. Wright. The fruits of this Japanese plum are $1\frac{1}{2}$ by $1\frac{1}{4}$ inches and heart-shaped; the stem is fairly stout and long, the basin small, the suture barely discernible, and the pit small. The flesh is firm and of good flavor, almost brown in color. A desirable variety for home use.

43182. PRUNUS SALICINA X CERASIFERA. Best's Hybrid Plum. From New Zealand. Plants presented by H. R. Wright. A medium-sized, early-

ripening globose, clingstone plum with greenish yellow skin and juicy, delicious flesh of the same color.

32670. PRUNUS SPINOSA X DOMESTICA. Hybrid Plum. From Kozlov, Russia. Scions presented by the originator, L. V. Mijurin. A hybrid between the Reine Claude and the sloe (*P. spinosa*). It has small, flattened, dark purplish, clingstone fruits with a touch of green. The taste is slightly astringent, resembling that of the damson. It is of good keeping quality and suitable for jams. Reported reasonably hardy in North Dakota.

32671. PRUNUS SPINOSA X DOMESTICA. Hybrid Plum. From Kozlov, Russia. Scions presented by the originator, L. V. Mijurin. A hybrid between the Reine Claude and the sloe (See S.P.I. 32670). The fruits which are of medium size and dark purple color, have a sweet flavor with a distinctive aftertaste. They are inclined to be astringent. A productive tree, worthy of trial particularly in cold regions.

32673. PRUNUS SPINOSA X DOMESTICA. Hybrid Plum. From Kozlov, Russia. A hybrid between the Reine Claude and the Sloe, presented by the originator, L. V. Mijurin. The fruits are of medium size, freestone, greenish yellow, covered with a heavy bloom. The rather firm and dry flesh is of good flavor. This is an excellent plum for canning and shipping and is worthy of trial in cold regions. (See S.P.I. 32670.)

36086. PRUNUS TOMENTOSA. Bush Cherry. From Tientsin, China. Collected by Frank N. Meyer, Agricultural Explorer. An ornamental fruiting shrub adapted to nearly all regions of the United States. The small white flowers, tinged with rose, are followed by small fruits which are suitable for preserves and jelly. The Chinese bud or graft this bush cherry on the remarkably thrifty wild peach, *Amygdalus davidiana*; in this way it makes a more vigorous growth and is better able to withstand drought and other adverse conditions than when grown on its own roots. Its extreme hardiness and its ornamental character suggest the value of this species for hybridizing.

55781. PRUNUS TOMENTOSA. Bush Cherry. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. Found in scrub forests near the Yangtze River, at altitudes of about 11,000 feet.

55782. PRUNUS sp. Cherry. From Szechwan, China. Collected by J. F. Rock, Agricultural Explorer. A fine, spreading tree 35 to 40 feet in height, found in the mountains at an altitude of 12,000 feet. The small oval red fruits have very small seeds. For trial principally as a stock plant.

55940. PRUNUS sp. Cherry. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 25 to 30 feet high found among limestone rocks at an altitude of 12,000 feet. The long-stemmed, bright-red, ovoid-oblong cherries, borne singly in the axils of the leaves, ripen late in September. The flesh is juicy, bitter, soft, and bright red; the stone is small. This cherry is suggested as a stock plant for alkaline regions.

55941. *PRUNUS* sp. Plum. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A small tree found along streams in the Likiang Plain at altitudes of 9,500 to 10,000 feet. The round, lemon-yellow fruits are about an inch in diameter. The tree is a prolific bearer and grows in alkaline soil.

56121. *PRUNUS* sp. Plum. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This small tree is found growing wild along brooks in the mountains, at an altitude of 6,000 feet. The globose, yellow, clingstone plums are little more than an inch in diameter, with firm, rather sour flesh. Introduced mainly for trial as a stock plant.

52390. *PTEROCARPUS MACROCARPUS*. From Korat, Siam. Collected by J. F. Rock, Agricultural Explorer. This tree known to the natives as Mai Padou, is one of the finest trees of Siam. It grows to a height of 150 feet, with a girth of 10 feet, measured 4 feet above the ground. The wood is very hard and is adapted for furniture and for construction work. The species may do well in Cuba, Porto Rico, and tropical America generally, but it is too tender for the mainland of the United States.

8646. *PUNICA GRANATUM*. Pomegranate. From Arabia. Collected by Barbour Lathrop and David Fairchild of this Department. A large and beautiful variety with rosy, thick skin and large, bright-red, juicy, sweet pulp; the flavor is pleasant and refreshing.

12566. *PUNICA GRANATUM*. Pomegranate. From Tunis. Cuttings collected by T. H. Kearney, Agricultural Explorer, on the premises of M. Robert, of Kalaa Srira. A variety grown in northern Africa; it has creamy pink flesh of medium size and very good flavor. The skin splits rather easily.

13298. *PUNICA GRANATUM*. Pomegranate. This beautiful large red mottled fruit has medium-sized, vivid red pulp of a sharp and vinous flavor. The skin is thick but inclined to split.

27049. *PUNICA GRANATUM*. Krylezy-Kabuk Pomegranate. Cuttings of a Russian variety collected by Frank N. Meyer, Agricultural Explorer, near Sukhum-Kale, Caucasus. The fruit is of medium size and shows little tendency to crack; the skin is fairly thick and uniformly deep red; the core is medium-sized, the grains deep-red; the juicy, slightly acid pulp has a rich and vinous flavor. This pomegranate, which resembles the variety "Wonderful," should be a good shipper.

27055. *PUNICA GRANATUM*. Pomegranate. From Russia. Cuttings collected by Frank N. Meyer, Agricultural Explorer. A variety called Elisavetpolsky Sladkyi, obtained from the vicinity of Elizabethpol. The fruits are large, with deep-red pulp of sharp, acid flavor. The tree is large and thrifty but the fruits split easily.

27961. *PUNICA GRANATUM*. Pomegranate. From Russia. Cuttings collected by Frank N. Meyer, Agricultural Explorer. A variety obtained

from the neighborhood of Elizabetopol, Russian Caucasus (which is famous for its pomegranates). The fruits are large, sometimes 5 inches in diameter, with bright-red skin; the flesh is sour-sweet and pleasant, and the pulp is deep red. The skin does not split readily.

27966. PUNICA GRANATUM. Kyrmisi Kabuk Pomegranate. Cuttings collected in the Caucasus by Frank N. Meyer, Agricultural Explorer. The fruits are large with rather thick crimson skin; the core is large, the grains deep crimson, the pulp very juicy, semiacid, and rather rich in flavor; the seeds are hard.

30615. PUNICA GRANATUM. Pomegranate. Cuttings presented by Miss Ida Munro, Putnam, Georgia. This thrifty, prolific variety bears medium-sized fruits. The skin is thin and cream-colored, dotted with light red, and free from splitting tendencies. The small core is surrounded by bright rose-colored, sweet, juicy pulp.

30619. PUNICA GRANATUM. Pomegranate. Cuttings from a bush at the east entrance of the Smithsonian Institution, Washington, D. C. Collected by T. H. Kearney of this Department. The color of the fruit is pale yellow splashed with red, the skin splitting very badly, the arils light pink, extremely acid, the seeds very hard. The flowers are very showy and the foliage dark and handsome. Its propagation as a hedge plant is recommended.

33227. PUNICA GRANATUM. Negro Monstruoso Pomegranate. From Spain. Cuttings obtained by Walter T. Swingle in the neighborhood of Granada. This is one of the principal varieties grown in that region and belongs to the "Spanish sweet" type. The fruits are large and of a brilliant red color, with light-red, juicy and abundant pulp of a delicious flavor, containing soft edible seeds. This variety has proved very successful in the pomegranate-growing regions of California.

33229. PUNICA GRANATUM. Rogises Pomegranate. Received from Pedro Giraud, Granada, Spain. In the neighborhood of Granada are cultivated the finest Spanish pomegranates, and many of the early introductions of this fruit into California in the days of the Spanish occupation were brought from that region. From the same source comes this attractive fruit, which is considered by many as one of the finest of pomegranates. It is of medium size, thin skinned, highly colored, and contains pink, sweet pulp, with soft seeds.

40736. PYRACANTHA CRENULATA KANSUENSIS. Fire-thorn. From China. Collected by Frank N. Meyer, Agricultural Explorer. This small spiny ornamental tree with orange-colored berries and very small foliage is found on stony mountain sides of northwestern China. It is suitable for moderate-wintered sections of the United States.

54991. PYRACANTHA CRENULATA YUNNANENSIS. Fire-thorn. Secured from Vilmorin-Andrieux & Co. Native in the mountains of western China. A handsome ornamental with glistening green leaves, bearing in fall and winter a multitude of bright-red berries. The variety differs from the typical form in being more vigorous, having much longer spines,

and less dentate leaves. The fruits are smaller, but brighter red and more abundant.

55997. *PYRACANTHA* sp. Fire-thorn. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A dense shrub, 6 to 8 feet high, which grows with *Prinsepia utilis* in arid situations in the valleys south of Likiang. It has bright-yellow berries instead of the scarlet fruits so common in this genus.

51883. *PYRUS BETULAEFOLIA*. Pear. Presented by John Dunbar, assistant superintendent, Department of Parks, Rochester, N. Y. A tall, very handsome tree from northern China, with crowded clusters of rather small flowers which are followed by globose fruits not much larger than peas. The tree is very hardy and fast-growing.

54095. *PYRUS BETULAEFOLIA*. Pear. Presented by the Arnold Arboretum, Jamaica Plain, Mass.

56688. *PYRUS CALLERYANA*. Pear. Received from J. Lossing Buck, acting dean, College of Agriculture, Nanking, China. A highly variable pear, known by its small flowers and fruits. Its chief importance is its hardiness; it withstands comparatively adverse climatic conditions and seems immune from most of the ordinary insect and fungous ills.

54097. *PYRUS CALLERYANA GRACILIFLORA*. Pear. Presented by the Arnold Arboretum, Jamaica Plain, Mass. A distinct variety which has looser and more slender flower clusters and pink anthers. It is quite ornamental.

54098. *PYRUS CALLERYANA TOMENTELLA*. Pear. Presented by the Arnold Arboretum, Jamaica Plain, Mass. A form differing from the type in having dense white tomentum on the young growth.

30361. *PYRUS CHINENSIS*. Pear. From Sinkiang. Collected by Frank N. Meyer, Agricultural Explorer. This pear, which is of large size and somewhat irregular shape, is called Kok-amoot or "green pear" by the Chinese. The surface is warty and green in color; the flesh gritty and not palatable until fully ripe and soft.

38263. *PYRUS CHINENSIS*. Pear. From Honan, China. Collected by Frank N. Meyer, Agricultural Explorer.

33207. *PYRUS COMMUNIS*. Favorita Pear. From Granada, Spain. Introduced by Walter T. Swingle, of this Department. A large, full-necked pear of greenish yellow color splashed with red. The flesh is tender, melting, and juicy. It has fruited in California, where it ripens about the middle of August.

54998. *PYRUS PASHIA*. Pear. From Kengtung, Burma. Collected by J. F. Rock, Agricultural Explorer. A spiny tree 30 feet high with a round crown and dark-green leaves. When this species blooms in pink and white upon the mountain slopes of western China it is one of the most glorious sights of that country. The yellowish brown globose fruits

about one inch in diameter are allowed by the Chinese to hang on the tree till they are black and dead ripe, when they are pleasantly sweet and are made into jellies. This species is said by some to be the stock upon which the native gardeners of Yunnan graft their sand pears.

56336. PYRUS PASHIA. Pear. From Yunnan, China. Obtained by Miss Clara Petersen for J. F. Rock, Agricultural Explorer.

30351. PYRUS SEROTINA. Pear. From Yarkand, Sinkiang. Collected by Frank N. Meyer, Agricultural Explorer. This is a round-oblong, yellow Chinese pear said to reach a very large size.

30352. PYRUS SEROTINA. Pear. From Karawag, Sinkiang.

55805. PYRUS SEROTINA X COMMUNIS. Hybrid Pear. Originated by the late Dr. Walter Van Fleet at Little Silver, N. J., and grown at the Plant Introduction Garden, Chico, California. It is a hybrid between the Golden Russet, an oriental pear, and one of the common European types. It is medium to large, roundish, with golden and speckled skin of deep russet hue. The flesh is whitish, sweet, slightly subacid, granular, and surrounds a medium core with a few large seeds. It is practically free from grit cells. The appearance of this pear is handsome and when properly ripened it makes a fine baking and preserving fruit. The trees are large and vigorous and bear heavy crops.

55998. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This hardy tree, which grows 15 to 20 feet high, is found on the Lashipa Plain at an altitude of 10,000 feet. It has very tough branches, and bears large numbers of fruits which are the size of marbles, and yellow, acrid, and unpalatable. Sometimes used by the natives of Yunnan as a stock plant for cultivated pears.

NOTE: The various species and varieties of *Pyrus* introduced from Yunnan through Agricultural Explorer J. F. Rock have been secured for trial primarily as stocks upon which to graft the pears already cultivated in the United States. Some of them are described by Mr. Rock as horticultural forms from gardens and orchards in Yunnan; in view of the fact that the plants here listed have been grown from seeds, not by budding or grafting, the fruits produced of these domesticated forms will not, in most instances, agree with Mr. Rock's descriptions.

56000. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild pear tree 20 feet high found on the Likiang Plain near the village of Lasadje. The fruits of this species are smaller than marbles, yellow, spotted and at first acrid, but perfectly sweet and black when ripe.

56008. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree reaching 45 feet in height and having long drooping branches. Although it is a domesticated species, called ho pa li by the Chinese, it is not grown in orchards, but individual trees can be found here and there, especially east of Tali Lake. The oval-oblong pears are fiery red with a yellowish base, very juicy and

subacid. They cook easily and become quite tender, almost like apple sauce; they may also be eaten uncooked. Although of fine appearance, this pear is not as good as the Shwe li or the Gan tz li.

56009. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. The fruits are somewhat irregular in shape, yellow on one side and brick-red on the other, with juicy, subacid flesh which is rather gritty in texture. This is a good cooking pear found around Haitung east of Tali Lake and called, by the Chinese, Ho shang li.

56010. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. The "fragrant pear" or Hseong ssu li is grown at Haitung, east of Tali Lake. It is a small fruit the size of an ordinary apple, butter-yellow, with acid, gritty flesh which is somewhat juicy and sweet. It is inferior to some of the finer strains of Chinese pears but is suggested as a cooking fruit and stock plant.

56011. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. Called in China the Shui pien li or "water-bank pear." As its name implies, this pear grows along ditches and watercourses. The fruit is shaped like a large apple, with yellowish green, spotted skin and subacid flesh. A good cooking pear.

56012. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. Grown only around Haitung, east of Tali Lake. The Shwe li or "snow pear" is one of the finest pears of the region. The fruit is uniformly pale green with soft, whitish, very sweet flesh. It is a good eating pear; when cooked it tastes like candied cantaloupe.

56013. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tall tree, 40 feet high with drooping branches which reach to the ground. Three varieties are sometimes grafted on one of these trees at once. The fruit is firmer than that of the Gan tz li, but is in other respects inferior. The skin is green with pale-yellow spots and the pale-white juicy flesh is hard and gritty. It is a good cooking pear and a prolific bearer.

56014. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. Called Gan tz li by the Chinese. It is a large spreading tree 35 to 40 feet high with branches drooping to the ground, growing only in an isolated area north of Talifu. The irregularly pear-shaped yellow fruits, somewhat reddish blotched, are about 4 inches long and 3 inches in diameter. The tender, subacid flesh is delicious.

56015. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. The "yellow skin" pear or Hoang pi li, is a very large, spherical, uniformly rich yellowish brown pear. The firm, greenish yellow flesh is subacid in flavor.

56016. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. The Ting mao li is a good eating pear,

in appearance resembling an apple. The skin is uniformly pale green with yellow dots, and the firm, pale whitish green flesh is subacid and very juicy. This is a better cooking pear than the Gan tz li, though not so delicious when fresh.

56102. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild pear, reaching 25 feet, which grows near Talishao at an altitude of 8,000 feet. The very numerous small fruits have yellowish brown skins, yellow flesh, and large seeds.

56103. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild pear tree 30 feet high, found near Talishao. It bears an abundance of globular, russet-brown fruits, an inch in diameter, with juicy, sour flesh.

56104. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree, about 25 feet high, with spreading whiplike branches, found in the mountains above the Hsia Kuan River. It bears an abundance of small, oval, russet fruits half an inch in diameter; the flesh is yellow and sour.

56105. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. In China this fruit is called Chwei li or "two catty pear," because it weighs two catties (2-2/3 lbs.). Its average size is said to be about 6 inches in diameter.

56108. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. In China this variety is called Tao li, meaning "fat pear." The shape of the fruit is generally oval but one-sided, and the wrinkled skin is yellow with a reddish tinge on one side. The flesh is whitish, juicy, and subacid.

56109. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer, from the gardens of the Swedish Mission at Kashgar. Shui pien li is the Chinese name of this variety, meaning "flat water pear." It grows at altitudes of about 5,000 feet. The fruit is the size of a very large apple, flattened at both ends, shining dark green with the side exposed to the sun bright red. The flesh is watery, gritty, and subacid. A good cooking pear.

56110. PYRUS sp. Pear. From China. Collected by J. F. Rock, Agricultural Explorer. The Tong li or "eastern pear." This variety was obtained in a native market in Yunnan; it is grown only on the Yungchang Plain. The large pyriform fruits are light green with yellowish spots, and the white flesh is juicy and subacid.

56111. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 30 feet high with ascending, whiplike branches, found wild in a valley at 6,500 feet. The tree bears numerous small, ovoid, russet-yellow juicy fruits.

56123. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This wild fruit tree, 25 to 30 feet high,

grows in hard clay soil in the mountains at 7,000 feet. The russet-yellow fruits are the size of small marbles.

56137. *PYRUS* sp. Pear. From China. Obtained by Miss Clara Petersen for J. F. Rock, Agricultural Explorer. A wild pear from the mountains near Puerhfu, at 6,000 feet. The globose, brown and spotted fruits are very sweet.

56138. *PYRUS* sp. Pear. From China. Obtained by Miss Clara Petersen for J. F. Rock, Agricultural Explorer. A large-fruited pear from the mountains north of Puerhfu. The flesh is juicy and there are only one or two seeds in each fruit.

56139. *PYRUS* sp. Pear. From Yunnan, China. Obtained in the mountains of Puerhfu by Miss Clara Petersen for J. F. Rock, Agricultural Explorer. A wild pear received without notes.

56140. *PYRUS* sp. Pear. From Yunnan, China. Collected by Miss Clara Petersen near Puerhfu, for J. F. Rock, Agricultural Explorer. A wild pear sent in without notes.

56141. *PYRUS* sp. Pear. From Yunnan, China. Collected by Miss Clara Petersen near Puerhfu, for J. F. Rock, Agricultural Explorer. A small round fruit with brown skin and juicy flesh. The tree attains large size.

56142. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer, near Menglieh. A wild tree 25 to 30 feet high with long branches. The globose, yellowish red, spotted fruits are an inch in diameter. This species appears to be closely related to *Pyrus pashia* of southern Yunnan.

56143. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild tree 35 feet high, spreading in habit, with a stout trunk; it is found most commonly in sandy soil, growing in the mountains about Tengyueh at 7,000 feet. The leaves are bronze-colored to red, and the numerous spherical, yellowish red, spotted fruits are about an inch in diameter.

56151. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This wild pear reaches 30 feet in height, and is characterized by long spreading branches; it is found in sandy loam at 5,400 feet, in the neighborhood of Mengka. The very numerous, spherical-compressed, russet-brown fruits are an inch in diameter.

56152. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This wild pear, growing in sandy loam at 5,400 feet, in the neighborhood of Mengka, has fruits that are small, oblong, pyriform, and reddish yellow. The tree bears abundantly.

56277. *PYRUS* sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild tree found in the mountains near Puerhfu, at an altitude of 6,000 feet. The large fruits, mellow when

ripe, are 3 to 4 inches in diameter.

56278. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A large tree 60 feet high, which grows in the mountains beyond Taho at an altitude of 7,000 feet. The numerous reddish-brown, somewhat acrid fruits are $2\frac{1}{2}$ inches in diameter.

56279. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree 30 feet high with a spreading crown, found at 6,500 feet altitude among oak trees in a valley north of Tengyueh. The globose, greenish brown fruits are no larger than bullets.

56280. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This large tree, 50 feet tall with a high ascending crown, is found on sandy soil in the Kuyung Mountains, north of Tengyueh, at an altitude of 7,000 feet. The numerous globose, greenish brown fruits are $2\frac{1}{2}$ inches in diameter.

56337. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer, and received without notes.

56338. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A tree of sturdy growth, which grows along watercourses on the eastern slopes of the Likiang Snow Range. It is 30 to 40 feet in height, with a dense crown and ascending branches. The small globose fruits are crimson when ripe.

56339. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. On the lower slopes of the Likiang Snow Range, where this wild pear grows at an altitude of 9,600 feet, it forms a tree 30 to 40 feet high. The oval fruit, about $\frac{1}{2}$ inch in diameter, is crimson when ripe.

56344. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A wild pear from the Likiang Snow Range at altitudes of about 10,000 feet. The tree grows 30 feet high and bears fruits $2\frac{1}{2}$ inches in diameter: the skin is yellow with small russet rings and spots.

56346. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A domesticated pear grown in the neighborhood of Likiang.

56347. PYRUS sp. Pear. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This wild pear was collected south of Likiang, where it grows 30 to 40 feet high, and bears small, spotted, russet-brown fruits the size of bullets. It is used as a stock plant by the Chinese.

56476. PYRUS sp. Pear. From Yunnan, China. Collected by Miss Clara Petersen from the region of Szemao for J. F. Rock, Agricultural Explorer. A wild pear introduced without notes.

56491. *PYRUS* sp. Pear. From Yunnan, China. Obtained by Miss Clara Petersen for J. F. Rock, Agricultural Explorer. A vigorous tree from the mountains of Puerhfu. The white flowers are borne in great profusion and the fruits remain for a long time on the tree, turning black and sweet when ripe. This species is used in southern Yunnan as a stock for cultivated pears.

56759. *PYRUS* sp. Pear. From China. Scions presented by K. M. Gordon. The Ya li or "duck pear" has orange fruits with thin, smooth yellow skin and juicy, white, sweet flesh. It is reputed to be a good keeper.

56765. *PYRUS* sp. Pear. From China. Scions presented by K. M. Gordon. The Laiyang is a variety which derives its name from its native town in Shantung. The fruit is large and dark-skinned, and is said to be very fine-grained, sweet and juicy.

56766. *PYRUS* sp. Peking White Pear. From Shantung, China. Scions presented by K. M. Gordon. The fruit of this variety, which is much grown north of Peking, is small and round with light lemon-yellow skin and fine-grained, sweet flesh.

55697. *RHODODENDRON ARBOREUM*. From Darjiling, India. Presented by G. H. Cave, curator, Lloyd Botanic Garden. This Himalayan rhododendron is variable both in its foliage and in the color of its flowers. In one phase the leaves are silvery on the lower surface, while in another they have a ruddy wool. The bell-shaped flowers borne in dense clusters vary from deep crimson to pure white. The tree sometimes reaches a height of 35 feet. Not likely to prove very hardy.

56356. *RHODODENDRON FORTUNEI*. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub, reaching 15 to 20 feet in height, which grows on the Likiang Snow Range at altitudes of 9,000 to 11,000 feet. The leaves are large and smooth and the handsome, fragrant, large pink flowers make it a striking ornamental.

50519. *RHUS POTANINI*. Sumach. From Honan, China. Collected by Joseph Hers and presented by Prof. C. S. Sargent, Director of the Arnold Arboretum, Jamaica Plain, Mass. A handsome ornamental shrub remarkable for the brilliant coloring of its cut-toothed foliage in autumn. Insect galls produced on these trees are utilized in China as the source of a valuable black dye.

55902. *RIBES GLACIALE*. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub 15 feet high, growing in alpine meadows at altitudes of 12,000 to 15,000 feet on the Likiang Snow Range. The flowers vary from cream-colored to red, and are followed by ovoid, red berries.

55092. *RIBES MEYERI TURKESTANICUM*. Black Currant. Presented by Vilmorin-Andrieux & Co., Paris, France. A shrub 3 to 4 feet high native to Turkestan, with reddish purple flowers and deep-purple, shining fruits, juicy, but without pronounced flavor.

55890. *RIBES* sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub which grows to a height of 5 or 6 feet in alpine meadows at an altitude of 12,000 feet, and to 15 feet in fir forests. It is a beautiful plant with pendent branches loaded with flowers early in May. In the latter part of August the fruits appear; these are yellowish red berries the size of peas, with an acid-sweet flavor.

56366. *RIBES* sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub 4 feet high which grows on the Likiang Snow Range at an altitude of 15,000 feet. The small, oval, black fruits are rather tasteless.

49343. *ROSA LAXA*. Rose. Presented by Hon. Vicary Gibbs, Elstree, England. This beautiful single rose is native to the Altai Mountains of Russia and to central Siberia. It has arching stems and very attractive white or pink flowers. The globose, pulpy fruits are bright red.

56113. *ROSA ROXBURGHII*. Rose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A low shrubby rose 2 to 4 feet high, which is found between Talifu and the Hsiakuan Plain at altitudes of about 6,800 feet. Its large, bright-red buds and magenta-red flowers make it very attractive. The compressed, fig-shaped fruits are an inch in diameter.

46002. *ROSA* sp. Rose. From Hupeh, China. Collected by Frank N. Meyer, Agricultural Explorer. A shrubby rose which sends up many stems. It has small foliage and bears single, medium-sized flowers of soft pink. It thrives in stiff, clay soil, resisting great humidity and high temperatures. This species was obtained from the gardens of a Roman Catholic convent at Ichang.

55721. *ROSA* sp. Rose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A fine climbing rose which grows in great profusion at 8,000 feet altitude near Likiang. It is a prolific bloomer, bearing large masses of flowers which are at first yellow, but turn white when fully opened.

56017. *ROSA* sp. Rose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A scrambling shrub or climber, 25 feet high with a spread of 30 feet or more, found with *Rosa banksiae*, all over the Lashipa Plain. The flowers, which are about an inch and a half across, when first open are yellow, and later become cream-colored. The orange-red fruits are borne in large, ample, compound clusters.

56126. *ROSA* sp. Rose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. This is a large rambling or climbing shrub which grows in the pine forests back of Yangpi, at an altitude of 6,000 feet. The flowers are said to be large and whitish cream-colored, and the fruits deep red to orange.

56281. *ROSA* sp. Rose. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A large climbing rose growing on the slopes of

the mountains near Mengka, at an altitude of 6,000 feet. The white flowers are in large terminal clusters, and the fruits are oval and reddish.

56367. *ROSA* sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A handsome climbing shrub from the Likiang Snow Range at an altitude of 11,000 feet. It reaches 16 to 18 feet in height and bears white flowers 2 inches across; the fruits which follow are bright red.

56368. *ROSA* sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A shrub attaining 8 feet in height and bearing small white flowers followed by rounded red fruits. It is found along water-courses on the Likiang Snow Range at altitudes of about 10,000 feet.

52939. *RUBUS ADENOPHORUS*. Bramble. Presented by Sir David Prain, director, Royal Botanic Gardens, Kew, England. A very distinct species with thick, armed stems, more or less black-glandular throughout. The rose-colored flowers and the black, edible fruits make this shrub both ornamental and economic.

55499. *RUBUS ELLIPTICUS*. Raspberry. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A stout shrub growing wild on the mountains around Talifu. The fruits are extensively collected and sold in the markets; those on the mountains ripen earlier than do those in the valley. The berries are deep yellow, almost orange, very juicy and acid.

51850. *RUBUS* sp. Bramble. From Rawalpindi, Punjab, India. Presented by R. R. Stewart and received without notes.

51851. *RUBUS* sp. (as above)

55630. *RUBUS* sp. Bramble. From China. Presented by F. A. McClure, Canton Christian College. An edible wild berry found in sandy soil near sea level, on the Island of Hainan. It is introduced for the use of plant breeders.

55755. *RUBUS* sp. Blackberry. From San Jose, Costa Rica. Collected by Edward Goucher, Plant Propagator. A large, scrambling species from roadsides near Cartago, at elevations of about 5,000 feet. The canes reach 7 or 8 feet in length, and the oblong, purple, somewhat acid fruits are the size of small northern blackberries. Of interest principally to plant breeders.

56114. *RUBUS* sp. Bramble. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A spineless shrub 8 feet high, found at an altitude of 8,000 feet on the Salwin Range. The solitary small fruits are yellowish red and watery. The silvery character of the leaves make this of interest as an ornamental shrub.

55041. *SABINEA CARINALIS*. From Dominica, British West Indies. Presented by Joseph Jones, curator, Botanic Gardens. A small leguminous

tree, known in Dominica as Bois Charibe. It is semideciduous, and produces in winter, before the appearance of the feathery leaves, a great profusion of scarlet flowers. Preliminary tests have indicated that it will thrive on the limestone soils of southern Florida, where it promises to become a valuable addition to the list of ornamentals which flower during the winter season.

53992. SALVIA SAGITTATA. From Ibarra, Ecuador. Collected by Wilson Popenoe, Agricultural Explorer. A slender plant reaching 3 feet in height, and bearing spikes of deep-blue flowers. It grows in Ecuador at altitudes of 8,000 to 9,000 feet. It should be tested in the United States as an annual, or perhaps as a perennial in California and Florida.

53757. SALVIA SQUALENS. From Loja, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. This is a handsome salvia which grows commonly on dry rocky slopes. The tubular flowers, produced in spikes, vary in color from a beautiful salmon pink or coral-pink to bright scarlet. It is suggested for trial in the United States as an annual flowering plant.

56829. SCHIMA sp. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. A fine tree 30 to 40 feet in height which grows in dense forests on the Salwin Watershed at 8,000 feet. The flowers are large and white, resembling single Camellias. It should be tested in southern gardens.

56372. SMILAX sp. Brier. From Yunnan, China. An attractive climber with beautiful red berries, found in pine forests on the Likiang Snow Range at 10,000 feet altitude.

54696. SOLLYA HETEROPHYLLA. Presented by Dr. A. Robertson Proschowsky, Nice, France. A handsome Australian climbing shrub somewhat resembling bittersweet. Its flowers are large, bell-shaped, lilac or purple, and in June and July they cover the plant with a profusion of bloom. The red calyces and flower-stalks and the persistent dark-green leaves form a charming contrast with the flowers. Propagation is by cuttings, layers and seeds.

55096. SORBARIA ARBOREA SUBTOMENTOSA. Presented by Vilmorin-Andrieux & Co., Paris, France. A large-flowered variety of the well-known ornamental shrub, native to Szechwan, China.

52379. STACHYS SIEBOLDI. Chinese Artichoke. Received from Vilmorin-Andrieux & Co., Paris, France. A perennial herbaceous Chinese vegetable, of which the tubers are eaten like potatoes. This dish has become very popular in France since its introduction there; it is served in the best restaurants and commands a high price. Prepared by the French method, the tubers are cooked for 12 or 15 minutes (if boiled longer they become watery) and are served with sauces, like broad beans; they may be fried or cooked in a variety of ways, or can be used in salads. They make excellent pickles in company with onions, peppers, gherkins, etc.

The tubers are small and numerous and look like a lot of closely strung beads. The plant is hardy and is propagated by the tubers. These are set out in rows in a rich loamy clay soil very early in spring, about potato-planting time. They are covered to the depth of 6 or 8 inches in hills 16 inches apart. The ground should not be stirred after the first of October, so as not to disturb the forming tubers which may be dug in November and should be stored in dry soil at a uniform temperature with protection from the air to prevent discoloration.

53918. STEVIA REBAUDIANA. From Paraguay. Presented by the Botanic Gardens, Asuncion, through D. S. Bullock, agricultural trade commissioner. A small shrub, with slender stems and inconspicuous white flowers, of little ornamental value, but interesting because it contains a sweet glucosid. When placed in the mouth and chewed, a single leaf is so sweet as almost to be unpleasant. As a possible substitute for sugar in the dietary of persons suffering from diabetes the species has attractive possibilities.

56018. STYRAX LANGKONGENSIS. From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer. An ornamental shrub 1 to 2 feet tall which grows in the arid region between Langchiung and Shapi at an altitude of 7,500 feet. The flowers are large, white, and drooping, with rich reddish brown calyces. It may prove of value as an ornamental for the Southern States.

32072. SYZYGIIUM CUMINI. Jambolan. Presented by Dr. L. Trabut, Algiers, Algeria. This handsome tree, a native of Asia, has long slender leaves somewhat resembling those of certain eucalypts. Its small black fruits, produced in clusters, are acidulous in flavor, suggesting sweet cherries. There is wide variation in the quality of fruit produced by different trees; that of some is large (an inch long), sweet, and pleasant, while that of others is smaller, and almost bitter. The tree is sufficiently hardy for cultivation in southern Florida and the milder parts of California.

56592. TACSONIA LANATA. From Bogota, Colombia. Presented by Brother Ariste Joseph, Instituto de la Salle. An evergreen climber native to Colombia. All parts of the plant are covered with downy wool. The long, slender, salmon-pink flowers are borne singly and are quite ornamental. The fruit is said to be edible.

51567. TACSONIA MANICATA. From Colombia. Collected by Wilson Popenoe, Agricultural Explorer. In Bogota this is called Curuba de Indio, and it is one of several cultivated species of Tacsonia in the neighborhood. It is not, as a fruit, so good as the Curuba de Castilla, since it has less highly flavored pulp, but as a vine it is more ornamental. The fruits are green, oblong, and about 3 inches in length. The tacsonias are closely related to the granadillas, (*Passiflora* spp.), and like them are adapted to cultivation only in the warmest portions of the United States.

56593. TACSONIA MOLLISSIMA. Curuba. From Colombia. Presented by

Brother Ariste Joseph, Bogota. This species is more commonly cultivated on the plateau of Bogota than any of the several others whose fruits are known as "curuba." The vine is not so ornamental but the fruit is considered the best; it is slender, oblong-oval, 2 to 4 inches long and slightly more than an inch thick, with a thin leathery skin (not brittle as in other species) inclosing many black seeds each surrounded by an orange-colored, juicy pulp. The flavor is sprightly and aromatic. While often eaten from the vine, the fruit is perhaps best when prepared in the form of crema de curuba or when made into an ice. It can be grown only in the warmest portions of the United States.

56633. TARAKTOGENOS KURZII. From Upper Chindwin, Northwest Burma. Collected by J. F. Rock from the tropical rain forests near the Siamese border. Chaulmoogra oil, which is derived from the seeds of this tree, has been known for several centuries to the natives of Burma and southwestern Asia as beneficial in the treatment of leprosy. The seeds, collected in distant and little-known mountain forests, have long been sold in the bazaars to persons suffering from leprosy, without the existence of any correct notion of the species from which the seeds were derived. In 1898 this valuable product was introduced into France by A. Bories. In 1900 Sir George Watt largely cleared up the mystery of the origin of chaulmoogra oil, while in recent years physicians in Hawaii and British India have undertaken extensive experiments in the application of the ethyl esters of chaulmoogric acid to leprosy cases and the measure of their success has been so great that they have come to regard this treatment as practically a specific cure. Dr. F. B. Power, of the Bureau of Chemistry, United States Department of Agriculture, has investigated the organic compounds derived from the fatty substances in the seeds of *Taraktogenos kurzii*, and other members of its family (Flacourtiaceae) and has prepared their respective ethyl esters. In 1919 and 1920, J. F. Rock, Agricultural Explorer, undertook an adventurous search for *Taraktogenos kurzii*, in which he was eventually successful. A large number of seeds were secured, and these seedlings are now available for experimental planting. Mr. Rock has discussed the cultural requirements of *T. kurzii* in "The Chaulmoogra Tree and Some Related Species," Bulletin No. 1057, U. S. Department of Agriculture, 1922. As therein pointed out, the remoteness of the forest trees which yield chaulmoogra, and the danger and difficulty of collecting the seeds and getting them to civilization in good condition make it imperative that the trees be brought under cultivation in populous regions where leprosy is prevalent.

43741. TECOMA ARGENTEA. From Asuncion, Paraguay. Presented by C. F. Mead. A small tree from Paraguay and southeastern Brazil, stiffly erect in habit, with handsome silvery leaves and clusters of yellow flowers. It has shown itself well adapted to the climate and soil of southern Florida, and is worthy of trial throughout the warmer parts of the United States.

56535. TECOMA GARROCHA. Presented by Dr. A. Robertson Proschowsky, Nice, France. A small shrub native to Argentina. It is strikingly handsome with its slender spikes of bright-yellow and scarlet flowers which are smaller and more graceful than those of the well known *Tecoma stans*.

22975. *ULMUS PUMILA*. Chinese Elm. From Peking. Collected by Frank N. Meyer. A medium-sized tree remarkably resistant to drought, alkali, and extremes of temperature. It has proved exceptionally valuable as a shade tree in the semiarid regions of the United States, where it has made phenomenal growth. It also seems well adapted to the cold northern plains of this country. Recommended highly, especially for regions unsuited to most of the common shade trees.

50588. *ULMUS PUMILA*. Chinese Elm. Presented by the Forestry Department, Ministry of Agriculture, Peking, China.

49822. *VANGUERIA INFAUSTA*. Mispel. From South Africa. Presented by J. Burt Davy, Johannesburg. A small tree with clusters of cherry-like fruits. These are greenish, acidulous, and contain a single stone. The species is superior to *Vangueria edulis* in being more hardy, and as the stem does not grow more than 7 feet high, the fruits are easily gathered. It is introduced for trial in Florida and California.

54990. *VANGUERIA INFAUSTA*. Mispel. From Matania El Saff, Egypt. Presented by A. Bircher, director, Middle-Egypt Botanic Station.

47575. *VERONICA ELLIPTICA*. From New Zealand. Presented by James W. Poynton. A much-branched shrub or small tree 5 to 20 feet high with large, pale-green, leathery leaves edged with a white margin. The large flowers are white with purple lines, and their fragrance is delightful. The shrub should be tested as a hedge plant in the milder climates of the United States.

54758. *VITIS AMURENSIS*. Amur Grape. From Harbin, Manchuria. Presented by B. W. Skvortzow. This hardy Siberian grape grows in dry, exposed, scrubby land in mountainous places. Its value lies in its very vigorous hardy growth and the beautiful purplish hue of its foliage. It should be tested as an ornamental for porches and pergolas.

55098. *VITIS DAVIDII*. Grape. Presented by Vilmorin-Andrieux & Co., Paris, France. A luxuriant climber native to central China. The young shoots are covered with spiny, hooked, red bristles. The fruits are black, about 2/3 of an inch in diameter, and of pleasant flavor.

54297. *WARSZEWICZIA COCCINEA*. Scarlet Plume. From Panama. Collected by David Fairchild, Agricultural Explorer. This remarkable tree is peculiar for bearing an enlarged colored sepal in each cluster of flowers which appears like a leaf of the most brilliant scarlet. The result in flowering time - which is of long duration - is to make the tree a mass of the most gorgeous color, resembling some species of maple and sour gum. This tree blooms in the summer or wet season of Panama, where a great proportion of tropical trees bloom only in the dry season; hence it is unusually valuable as an ornamental. It is not, so far as can be ascertained, known in cultivation except at Trinidad where it was first discovered. It is native along the sea-coast from Central America to Brazil.

43053. *ZEPHYRANTHES* sp. From El Banco, Bolivar, Colombia. Pre-

sented by H. M. Curran. A small, white-flowered bulbous plant cultivated in the gardens along the Magdalena River. It is related to the Atamasco Lily of gardens.

38180. ZINZIBER OFFICINALE. Ginger. From Feicheng, Shantung, China. Collected by Frank N. Meyer, Agricultural Explorer. When originally introduced, some years ago, Meyer described this as a variety of the ordinary commercial ginger grown on sandy loam and much sold in the Shantung markets. Experiments at the Plant Introduction Garden near Washington have shown that it can be grown in that latitude without the least difficulty, when treated as an annual. The rhizomes, which are gathered in early fall, may be stored in dry sand over winter and replanted in spring. Clumps may be divided annually, some of the roots being saved for replanting and others used for the preparation of preserved ginger, dried ginger, and other products. No particular cultural attention is required. The plant thrives in a moist well-drained soil.

Introduced Varieties of the Jujube.

Note: **ZIZIPHUS JUJUBA**, the Chinese jujube, is one of the five principal fruits of China. It occurs in many excellent horticultural varieties, and has been cultivated for at least 4,000 years. The four kinds described below were secured and introduced into the United States by the late Frank N. Meyer. Investigations in China and tests carried on at Chico, Calif., and elsewhere, for the past ten years have convinced us that the jujube is suited for cultivation in the semiarid regions of the Southwest where soil alkalinity, early spring frosts, and a light rainfall limit the growing of many other fruits. The tree, often very ornamental, ranges from 15 to 40 feet in height.

Jujubes are utilized in China in a great variety of ways, fresh, boiled with millet and rice, or baked. When they are processed, or made into glace fruits by scoring and boiling them in honey and sugar sirup, they are strikingly like dates. Experiments with the fruits in this country have demonstrated the possibility of their being utilized as a dainty and delectable confection when processed.

22684. ZIZIPHUS JUJUBA. Mu shing hong jujube. From Tsintse, Shansi, China. Scions collected by Frank N. Meyer, Agricultural Explorer. The fruits of this variety are ellipsoidal, somewhat flattened at the end, and of large size, sometimes as much as $1\frac{1}{2}$ inches broad. The stone is medium to large, and sharply pointed. Sometimes the bony portion of the stone does not harden, thus giving rise to what are termed seedless fruits. While trees of this variety do not bear as heavily as do those of some other sorts, the fruits have a high sugar content. An excellent jujube with shapely fruits which process well.

22686. ZIZIPHUS JUJUBA. Lang jujube. From Tsintse, Shansi, China. Scions secured by Frank N. Meyer, Agricultural Explorer. The fruits are obovoid to pear-shaped, sometimes oblique, of large size, often as much as an inch and a half in greatest diameter. The stone is ellipsoid, medium-sized, tapering to one end which terminates in a sharp spine. This variety is a heavy bearer, and the fruits have a high

sugar content. Undoubtedly it is one of the best sorts yet tested in the United States.

38245. ZIZIPHUS JUJUBA. Sui men jujube. From Paihsiangchen, Shansi, China. Scions secured by Frank N. Meyer, Agricultural Explorer. The fruits of this variety are ellipsoidal, medium-sized, and up to $1\frac{1}{2}$ inches in length by $\frac{1}{2}$ inch in thickness. The stone is medium-sized, tapering toward one end and terminating in a sharp point. The variety is an excellent one for general purposes, and processes well.

38249. ZIZIPHUS JUJUBA. Li jujube. From Fuma, Shansi, China. Scions collected by Frank N. Meyer, Agricultural Explorer. This is the largest variety yet introduced into this country, and is somewhat later in ripening than most others. The fruits are round to ovoid, and $1\frac{1}{4}$ to 2 inches long. The stone is rather large, ovoid, tapering toward one end with a sharp point. An excellent sort and highly recommended.

45635. ZIZIPHUS MAURITIANA. Indian jujube. From India and southern China. Presented by G. Regnard from plants grown in Port Louis, Mauritius Island, Africa. This moderate-sized tree is cultivated in villages of western India and is found wild in the forests of the Punjab and United Provinces. The leaves are dark green above, woolly below; the spines, if present, are short. The flowers are borne in several-flowered axillary flat clusters similar to those of the common jujube, *Z. jujuba*, except that the flower stalk and calyx are abundantly soft-hairy. The fruit is spherical and generally one inch in diameter with a stone larger in proportion to the flesh than the Chinese jujubes. The fruits are generally quite acid, though by cultivation they are much improved both in size and flavor, resembling crab apples. The ripe fruits are excellent when stewed, and when unripe they may be pickled. The pulp is dried, mixed with salt and tamarinds to form a condiment, or is made into chutnies. The leaves constitute a valuable forage and the bark yields tannic acid. The hard reddish wood is used in ordinary construction work and in furniture making. In the continental United States this species can probably be grown in southern Florida and the warmer sections of California. Its handsome foliage renders it an attractive ornamental.

55485. ZIZIPHUS MAURITIANA. Indian jujube. Presented by S. K. Mitra, economic botanist, Assam, India.

